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Frontispiece
Annals of Medical History
January, 1932

JOHN LOCKE

[1632-1704]

[From Erastus: Varia Opuscula Medica Francofurdi, 1590.]

ANNALS OF MEDICAL HISTORY
NEW SERIES, VOLUME IV JANUARY, 1932 NUMBER 1

WILLIAM CLOWES AND HIS "PROFITABLE AND NECESSARIE BOOKE OF OBSERVATIONS"

By RALPH H. MAJOR, M.D.

KANSAS CITY, MO.

ONE of the most picturesque and interesting figures in the history of English surgery was William Clowes the elder, who lived during the reign of Queen Elizabeth. England never passed through a more exciting or troublous period than those days following the accession of Elizabeth to the throne. Many of the most romantic adventurers, the bravest warriors and the most renowned poets wrote their names upon the pages of English history of this period. Hawkins, Drake and Raleigh were fighting Spanish dominion of the seas and thrilling the entire English nation with their exploits on the Spanish Main. Spain was gathering her forces for the conquest of England, a dream shattered by the destruction of the Great Armada, in which Clowes took part. Warwick was fighting on the Continent, the Catholics were still dreaming of subjugating England and Catherine de Medici was plotting and counterplotting against the Protestant cause. In a more peaceful walk of life, Ben Jonson was composing his ballads and comedies and William Shakespeare was struggling with his debts, and writing and acting his dramas.

The London that Clowes knew differed much in appearance from the London of today, for it was London before the Great Fire. St. Paul's Cathedral which dominated the landscape was a huge Norman cathedral with a tall steeple, quite unlike Sir Christopher Wren's masterpiece which we view today. In the nave of the old cathedral, merchants with their hats on, carried out their business transactions and used the baptismal font as a counter over which they made their payments. Fleet Street was the showplace of London where naked Indians and strange monsters were on exhibition, the Strand was a street of noble mansions, St. Giles was a village, Piccadilly "the way to Redinge," and the people went out to the suburb of Bloomsbury for fresh air and sunshine. Another landmark along with St. Paul's Cathedral was the Globe Theatre where William Shakespeare acted during Clowes' lifetime and the Bear Garden where one of Clowes' patients fractured his skull and thigh. While Clowes makes no mention of his famous contemporary in letters, he refers frequently to some of the history makers of this period and his writings preserve for us the most interesting pen pictures of the interesting epoch in which he lived.

William Clowes was born in 1544 at Kingsbury, Warwickshire, and was fourteen years of age when Queen Elizabeth came to the throne. He learned surgery as an apprentice to Master George Keble, a London surgeon to whom he frequently refers in terms of praise and gratitude. "Sure," he wrote in later years, "Alexander was never bound to Aristotle, his master, for his lessons in philosophie, than I was bound to him for giving me the first light and entrance into this noble art of chirurgerie."

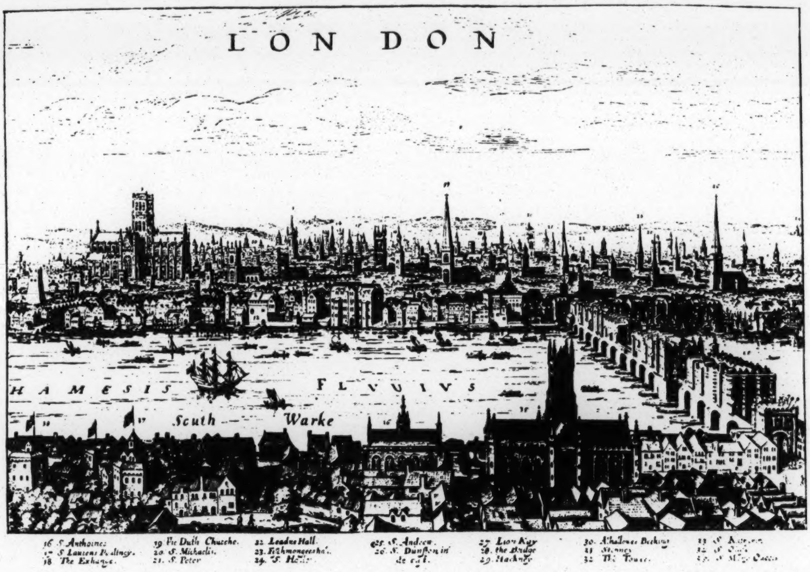
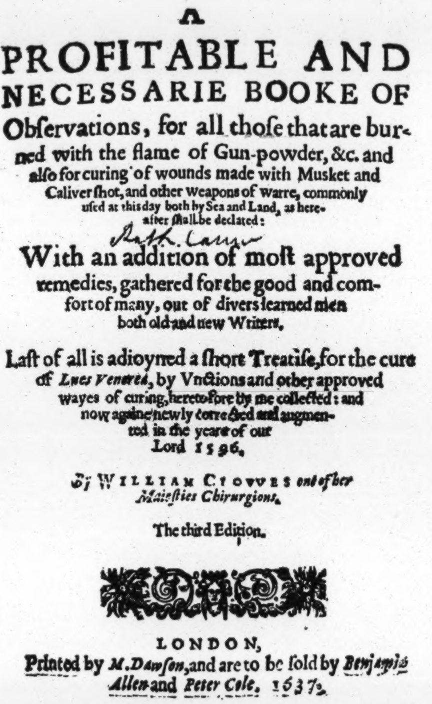


Fig. 1. London in Clowes' Time. St. Paul's Cathedral Is Seen on the Left. In the Fore Ground, No. 37, Is the Globe Theatre, No. 38, the Bear Garden. (From Werdehagen, "De Rebus Publicis Hanseaticis," 1641.)

Clowes began practice as a surgeon in the army of Ambrose, Earl of Warwick. Here he had an excellent opportunity of seeing war surgery and here began his lifelong friendship with a surgeon named John Banester. In a letter to "Master Banester, my dear and loving friend," he gives many reasons for this friendship and concludes, "but chieflie for that we both do serve under the Right Honorable Earle of Warwick our verie good Lord and Master, whom God long preserve in health."

Following Warwick's unsuccessful campaign in France, Clowes served for several years in the navy and then settled in London about 1569. He was soon after admitted into the Barber-Surgeons Company and in 1575 was appointed to the surgical staff of St. Bartholomew's Hospital, becoming full surgeon in 1581.



A
PROFITABLE AND
NECESSARIE BOOKE OF
Obſervations, for all thoſe that are burned with the flame of Gun-powder, &c. and
alſo for curing of wounds made with Musket and
Caliver ſhot, and other weapons of warre, commonly
uſed at this day both by Sea and Land, as hereafter ſhall be declared:
With an addition of moſt approved
remedies, gathered for the good and comfort of many, out of divers learned men
both old and new Writers.

Laſt of all is adioyned a ſhort Treatiſe, for the cure
of *Lues Venerea*, by Vnctions and other approved
wayes of curing, heretofore by me collected: and
now againe newly corrected and augmented in the yeare of our
Lord 1596.

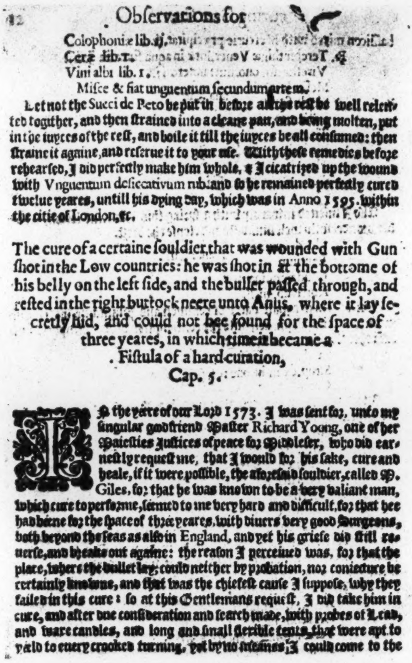
By WILLIAM CLOWES *one of her*
Maieſties Chirurgions.

The third Edition.

LONDON,
Printed by *M. Dawſon*, and are to be ſold by *Benjamin*
Allen and *Peter Cole*. 1637.

Fig. 2. Title-page of Clowes' "Profitable and Necessarie Booke."

In 1585 he resigned his position at St. Bartholomew's Hospital because of "her Majestie's commandment to goe into the Low Countries to attend upon the Right Honorable Earl of Leicester, Lord Lieutenant and Captain General of her Majestie's forces in those countries." Leicester, it may be recalled, was sent by Queen Elizabeth to help the Dutch against the Spaniards. He landed in Holland with a force of five thousand foot and one thousand horse and was immediately invested with the title of Governor-General and given sovereign powers. He was, however, severely reprimanded by the Queen for accepting such honors and he and the government of the Netherlands forced to apologize to the Queen. The Dutch, however, added as an appendix to their apology that they could not revoke such an appointment after it had been made and Leicester was allowed to retain his title. Leicester, however, had many difficulties with the Dutch because of his overbearing manner and his attempt to pack their parliament with his personal friends, and was recalled by Elizabeth in 1587.



12 Obſervations for

Colophoniæ lib. ij.
Ceræ lib. 1.
Vini albi lib. 1.
Miſce & fiat unguentum ſecundum artem.

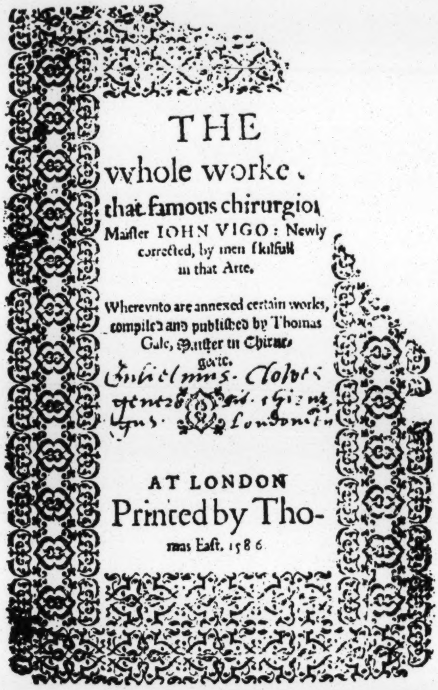
Let not the Succi de Peto be put in before all the reſt be well relented together, and then ſtrained into a cleane pan, and being molten, put in the iuyces of the reſt, and boile it till the iuyces be all conſumed: then ſtraine it againe, and reſerue it to your uſe. With theſe remedies before rehearſed, I did perfectly make him whole, & I cicatrized up the wound with Vnguentum deſiccativum rub: and ſo he remained perfectly cured twelue yeares, untill his dying day, which was in Anno 1595. within the citie of London, &c.

The cure of a certaine ſouldier, that was wounded with Gun ſhot in the Low countries: he was ſhot in at the bottome of his belly on the left ſide, and the bullet paſſed through, and reſted in the right buttock neere unto Anus, where it lay ſecretly hid, and could not bee found for the ſpace of three yeares, in which time it became a Fiſtula of a hard curation,
Cap. 5.

IN the yeere of our Lord 1573. I was ſent for, unto my ſingular good friend Maſter Richard Yoong, one of her Maieſties Iuſtices of peace for Middleſex, who did earneſtly requeſt me, that I would for his ſake, cure and heale, if it were poſſible, the aforeſaid ſouldier, called M. Giles, for that he was knowen to be a very valiant man, which cure to performe, ſeemed to me very hard and difficult, for that hee had beene for the ſpace of three yeares, with diuers very good Surgeons, both beyond the ſeas as alſo in England, and yet his griefe did ſtill reuerſe, and breake out againe: the reaſon I perceiued was, for that the place, where the bullet lay, could neither by probation, nor coniecture be certainly knowne, and that was the chiefeſt cauſe I ſuppoſe, why they failed in this cure: ſo at this Gentlemans requeſt, I did take him in cure, and after due conſideration and ſearch made, with probes of Lead, and waxe candles, and long and ſmall flexible tents, that were apt to yeeld to euery crooked turning, yet by no meanes I could come to the

Fig. 3. Page from Clowes' Book.

Thus Clowes' second war experience, like his first, was, from a military standpoint, a failure. But from the surgical standpoint it was not only a great experience, but a success, for he says he lost no cases from gunshot wounds except those mortally wounded at once, although he remarks that bad surgeons in the army slew more soldiers than the enemy.



THE
vvhole worke
that famous chirurgion
Maiſter IOHN VIGO: Newly
corrected, by men ſkilfull
in that Arte.

Whereunto are annexed certain works,
compiled and publiſhed by Thomas
Gale, Maiſter in Chirur-
gerie.
Gulielmus · Clowes
generosis · chirur-
gus · Londoniensis

AT LONDON
Printed by Tho-
mas Eaſt. 1586

Fig. 4. Signature of Clowes on His Own Copy of Vigo's "Whole Worke." Gulielmus Clowes Generosis, Chirurgus. Londoniensis. (Kindness of Dr. W. W. Francis.)

In the following year, 1588, he once more responded to his country's call, this time in a more successful military venture, for he served in the navy when it defeated the great Spanish Armada. He then returned to London where he was quite successful in practice, received a confirmation of his coat of arms and a statement of his public services and his descent. A few years later he retired to his country house at Plaiston in Essex, where he died in 1604, during a severe epidemic of plague and probably from this disease.

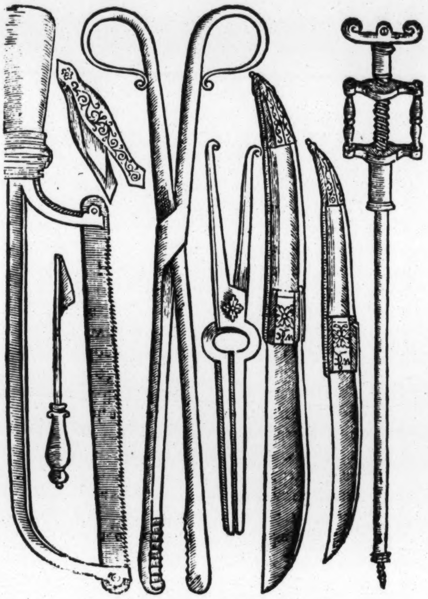


Fig. 5. Surgical Instruments.

Clowes is always an interesting writer, never obscure, and his works are full of shrewd observations and sensible conclusions. As Norman Moore remarked, "he is as full of proverbs as Sancho Panza and has them for all occasions." In answering his enemies, who often attacked him fiercely, he says, "therefore, I say unto such aforesayd, let not the Paynter goe beyond his pensill nor the shoomaker beyond his shoo, for so his pride may have a fall." "He is called an ill Fisher that cryeth stinking Fishe." "It is no conquest to beat an Asse to death." Referring to his own work, he says, "I do not heere rehearse a tale of a tub which requireth no larger remembrance than the view."

Clowes had many interesting clashes with the quacks of his time and handled them without gloves. He freely showered them with abuse and expressed his contempt for their attacks upon him by remarking that "the greatest barkers are not the best biters." He once described one of these irregular practitioners as "more fitter to be made a turne-broche or a scullion of a kitchen than to be admitted to be eyther a Physition or Surgeon." Occasionally he answered his critics with verse, such as:

> No man can lead so just a lyfe
> No works be writ so true
> Than can escape their squinting eyes
> Or passe their elvish view.

Clowes began his career as a writer with "De Morbo Gallico" in 1579. In 1591 he published "a Prooved Practice of all young chicurgians concerning Burnings with Gunpowder, and Wounds made with Gunshot, Sword, Halbard, Pike, Launce or such other," and the same year his "Treatise of the French or Spanish pocks by John Almenar." In 1596 a second edition of his "Proved Practice" appeared with the title "A Profitable and Necessarie Booke of Observations, for all those that are burned with the flame of Gunpowder &" which was reprinted in 1637 with his "De Morbo Gallico." In 1602 he published "A right Fruitful and Approved Treatise for the Artificial cure of Struma or Evill, cured by the Kings and Queens of England."

Clowes had a fair knowledge of French and Latin and quoted freely from Tagault, Guido, Vigo and Quercetanus. He was familiar with seventeen English medical authorities, but with all his book learning he trusted much to his own observations and his writing breathes a spirit of inquiry and research, which is in marked contrast to the works of most of his contemporaries.

His most interesting work is his book on surgery. The copy from which these observations were collected is the third edition. It bears the title "A Profitable and Necessarie Booke of Observations, for all those that are burned with the flame of Gunpowder &c, and also for curing of wounds made with Musket and Caliver shot, and other Weapons of Warre, commonly used at this day both by Sea and Land, as hereafter shall be declared: Etc by William Clowes one of her Maiesties Chirurgions—London, Printed by M. Dawson and are to be sold by Benjamin Allen and Peter Cole, 1637." Bound with this book are his "Briefe and Necessary Treatise, Touching the Cure of the Disease now usually called Lues Venerea," a trea-

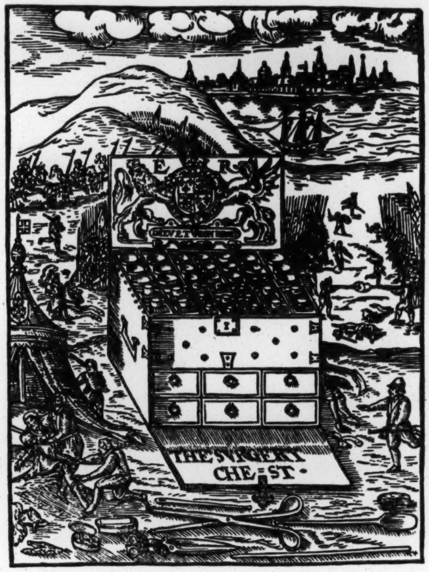


Fig. 6. Surgery Chest from the 1596 Edition of Clowes' Book. In Some of the Clowes' Books the Lid of the Chest Shows the Arms of the Earl of Warwick Instead of the Royal Arms.

tise on "The Nature and propertie of Quicksilver by G. Baker one of her Maiesties Chirurgions," and Thomas Vicary's "A Treasure for English Men, containing the Anatomy of man's bodie." Vicary's treatise is more than an anatomy and contains in addition to a large number of surgical observations "A briefe Treatise of Urines" and a chapter "of the Bath of Bath in England." Alfred Brown who has examined this third edition of Clowes' "Booke of Observations" states that with the exception of the illustrations, it is identical with the second edition even to the numbering of the pages.

The book begins with the dedication "To all the true professors of Chirurgerie in generall wheresoever, WILLIAM CLOWES wisheth all happiness, with much increase of knowledge in the art of Chirurgerie."

> The Epistle Dedicatorie [after commending] this booke to the favorable consideration of the friendly Readers [concludes] with the waighty saying of Aristotle, that the greatest part of those things, which myselfe doth know in this art of Chirurgerie, is the smallest portion of those things, whereof I am ignorant and know not; wishing that it will please the Almightie God, to blesse my labours with a happy and good successe, Amen, William Clowes.

Clowes then begins his "Observations, now as followeth, are set down the severall cures of sundry persons, which by God's helpe have been finished and cured." He describes first the accident that happened to two gentlemen in 1577, who were drying some Gunpowder in a pan and stirring it with their hands. The powder suddenly fired and they were most grievously burned, both hands, and face and over their bodies. Clowes was sent for and treated the burns first with a mixture of salt and onion juice and later with four different ointments. "In the end," he writes, "I finished these cures, without blemish or manifest signs of any burnings, with the after-using of Oleum ovorum & Oleum Amygdalorum dulcium &c."

Our author now dissertates at some length on the treatment of burns: "Now heere followeth certaine remedies, good for burning with Gunpowder Cap 2." He warns against cutting or opening blisters and gives a series of prescriptions containing ointments, one of which he praises highly, litharge, oil of roses and oil of poppy.

His third chapter describes the cure of a "Marchant of good account" who was in "Vlushing in Zealand, there making great sute unto the Prince of Orange and the States." This good merchant, one Thomas Gore, was standing, it seems, at the door of his lodging "beholding a band of Dutch soldiers as they were marching to the wars." It seems to have been "the manner of some souldiers in a bravery to discharge their peeces as they passe by" and one of these soldiers suddenly fired on Gore, wounding him in the hand and arm. He was brought to London and Clowes treated him with cataplasms in six different varieties "and thus I performed this worke and cured him perfectly within this citie of London."

Clowes' fourth patient had also had some unpleasant experiences with the inhabitants of Flushing. This was "one Master Andrew Fones, a Merchant of London, who being in a ship at sea was set upon by the Flushingers, in which fight he was very dangerously wounded with Gunshot. Cap. 4." This unfortunate merchant was shot through the "*Os furculae*, or the channell bone" "and the *Os scapulae* or the shoulder blade." He was treated for a long time by "two of the Prince of Orange Chirurgions, to his great cost and charges, yet it profited him nothing." Fones came to London, Clowes was sent for and after speeches which Clowes had prepared himself, he made an incision and removed the shot. Clowes seems to have lavished much care upon this patient's after-treatment for he describes in great detail ten different ointments with which he dressed the patient's wounds, but his efforts were rewarded for "I did perfectly make him whole . . . and so he remained perfectly cured twelve years, untill his dying day, which was in Anno 1595, within the citie of London."

These two surgical histories suggest that Flushing was not altogether a safe place for an Englishman in the sixteenth century. It is also noteworthy that Clowes gives us no account of any international complications following these two unprovoked shootings. The present-day reader can easily imagine what would happen if a Dutch soldier today fired point-blank at an honest British merchant sojourning in Flushing. But England then was not the world power she later became; the tradition that the British fleet protected every subject of the King, was not yet born. England had her hands full in keeping invaders off her shores and "this present troublesome time" as Clowes described it elsewhere, did not allow Queen Elizabeth to protect her subjects just across the Channel.

Clowes' next case taxed his ingenuity and resourcefulness to the limit and he emerged from the trial completely successful. This was:

> The cure of a certaine souldier that was wounded by Gun shot in the Low countries; he was shot in at the bottom of his belly on the left side, and the bullet passed through and rested in the right buttock neere unto Anus, where it lay secretly hid, and could not bee found for the space of three yeares, in which time it became a Fistula of a hard curation. Cap. 5.

Clowes used probes smeared first with mild lotions and later with irritating ointments but had no success. Then suspecting that he was dealing with a curved and tortuous passage he remembered the "Counsell of Tagaltius" and employed "a syring that had a long pipe and a large barrell" and injected "acqua fallopii" (containing mercury and alum) into the fistula and then stopped up the orifice of the fistula. The patient was ordered to lie on his right buttock and "within XIIII hours after hee did greatly complaine of extreme paine in his right buttocke neere unto Anus, and there did I perceive it to be greatly tumified and swolne." Clowes applied a poultice over the swelling, and the following day made an incision into the swelling "and did take out the shot."

Another very interesting case is related by Clowes, which taxes our credulity and makes us wonder if there was anything this enterprising surgeon could not do. This is:

> The cure of one *Henry Rodes*, one of the waiters at the Custome-house, he being upon the river of Thames a skirmishing with his peece, and by reason the peece had certaine flawes in it, did breake into many peeces, and made a great wound upon his chin, and carried away a good part of the Manduble and the teeth withall; moreover it did rend his hand greatly: all of which I cured without maine or deformitie.

We can easily accept his statement that the hand was not maimed or deformed after his treatment with ointments and gargles, but we are left in the dark as to how he repaired his patient's face minus a good part of its mandible and teeth. He merely tells us "this wound of his chin was in a short time perfectly cured," and not a word about how he replaced the missing mandible and teeth. To cure this patient without any deformity would have taxed the ingenuity of Tagliacozzi himself.

Clowes' patients seem to have come from far and wide. In Chapter 8 we find him treating a "souldier being wounded with a poisoned arrow upon the coast of Brasile" and this chapter pictures very vividly for us how part of the crew of a man of war put ashore on the Brazilian coast to obtain water, were attacked by a "certaine number of savage wilde naked people." One of the soldiers was wounded in the thigh and the crew "were a long time after upon the seas, and endured marvellous stormes and tempests and much adoe they had to bring home their ship, and recover the coast of England, in which time many of their men fell sicke of the scurvie." From our previous acquaintance with Clowes we can confidently predict that the patient after trying divers sorts and conditions of surgeons finally sent for our surgeon and was cured. Again we are not disappointed although Clowes admits some assistance here, for after "the onely application of *Emplastrum Stricticum Paracelsi*, laid upon the orifice of the Fistula, nature wrought the rest of the cure, and so within a reasonable time after, he was perfectly healed."

A most interesting picture of some phases of life in the days of Queen Elizabeth is painted in the chapter which describes the cure "of one master Buckland who lived in Reading, a towne in Barkshire; he received a puncture or prick into the sinew or nerve of his right arme, by a most impudent and ignorant bloud-letter, which did prick the sinew instead of the liver veine." This Master Buckland came to London and "after his body was well prepared and purged," his doctor prescribed the extraction of 8 oz. of blood from the liver vein and referred him to a surgeon. This surgeon could however not be found, but the mutual friend who always comes to the scene at such times and always knows of a good doctor, appeared and said, "If it please you I will send for one that I doe partly know, which is not onely a good Surgeon, but for letting of blood and drawing of a tooth, hee is supposed to be as skilfull as any man in towne." Master Buckland then sent for the man and "delivered unto this bragging tooth-drawer, and bloud letter, the Physitions bill, which was written in English, but hee answered and said, Truly I can neither write nor reade: neverthelesse, doubt you nothing but I can and will doe it, as well as any man whatsoever." The patient then read the physician's prescription to the "bragging tooth-drawer" who proceeded apparently to make a hole in the tendon of the biceps. This procedure caused the patient a great deal of pain and he fainted.

His friends were much disturbed and blamed the blood-letter who retorted that it was all the patient's fault for not holding his arm still. "Then one of the standers by answered, a blinde shift is better than none at all, you might as well have said, that he had eaten his horse, because his saddle lieth under the bed." But this was not the end of his troubles because the wound was infected, he had "also a feaver, shivering and raving, and at certaine times convulsions."

Much of this chapter is devoted to a dialogue between Clowes and the blood-letter. The latter complains to Clowes that it is "your manner that are Surgeons of London to hide and excuse one another's fault, and to speak against such as I am, because I am a stranger, and none of your Companie, and therefore, I am despised and my medicine dispraised." Clowes retorted that honest men who are diligent and study hard may become proficient and accepted as members of the Surgeons Company:

> . . . but contrariwise, intruders, deceivers, braggers and boasters, and such shameless shifters as your selfe is, which without either reason or skill, does abuse the art, and spoile the people, we exclude such bad persons cleane from us, and doe account you all a sort of caterpillers and coseners, not worthy to live in the countrie and commonwealth.

Clowes then discussed the danger of skin pricks and quoted at some length both Galen and Tagault. But the proud boasting blood-letter answered, "I care neither for Galen nor the other man you speake of . . . I have done as good cures as the best of them both." Clowes then became really ashamed of his "imprudency and beastly boldness" and commanded him to leave the place. The annotator who composed the rubrics in this book places opposite this paragraph "Note the rude answer of this proud boasting bloud-letter to Clowes." The impartial judge may feel however that honors were even. We are all familiar with the present-day surgeon's attitude towards certain irregulars, but he may take pardonable pride in his restraint which keeps him from talking as frankly before his patients as Clowes did. The irregular too has obvious advantages over Clowes' rival, the boasting blood-letter, who could neither read nor write prescriptions.

In a very interesting and well written chapter Clowes describes "the cure of two Seafaring men who fell sicke at sea of the Scorby. Cap. 21." Scurvy, Clowes:

> . . . gathered by inquiries, was reputed principally unto their rotten and unholsome victuals, for they said their bread was musty and mouldie, Bisket, their baere sharpe and sower like vinegar, their water corrupt and stinking, the best drinke they had, they called Beveridge, halfe wine and halfe putrified water mingled together. [Their fare was so bad that] they were constrained to stop their noses, when they did eate and drinke thereof.

Clowes describes their appearance in striking terms.

> Their gums were rotten even to the very rootes of their teeth, and their cheekes hard and swollen, the teeth were loose neere ready to fall out . . . their breath of a filthy savor. [Their] legs were feeble, and so weake, that they were scarce able to carrie their bodies; moreover they were full of aches and paines, with many blewish and reddish staines or spots, some broad and some small like flea-biting.

Clowes bled the two men and gave them a drink of ale to which was added scurvy-grass, pepper, cinnamon, ginger and saffron, a concoction which he assures us was "delicious to drinke." He also gave them water cress, barley, "ote-meale," wine, mutton, veal and chicken. He also washed their mouths with vinegar and salt water and records that "thus by the help of God and careful diligence, [they] were both perfectly cured." Clowes' conceptions both of the origin of scurvy and of one of the proper treatments were obviously sound, yet the "sailors calamity" continued to decimate the King's Navy until the well known observations of James Lind bore fruit some two centuries later.

An interesting sidelight on the sports of the merrie old English in the sixteenth century is given in the account of the cure of a man who fractured his skull and thigh "by a fall out of a gallery in the Beare garden, at that time when all the gallery there did fall downe, and killed and hurt many. Cap. 18." This accident occurred during the spectacle of bear-baiting and probably the spectators in the gallery became so excited and boisterous that they broke down the gallery. The Bear Garden was located in Southwark near the Globe Theatre.

Bear-baiting and bull-baiting were very popular sports in Clowes' time. The bear was usually chained by one hind leg and worried by dogs. Robert Loneham describing a famous bear-baiting, which took place before Queen Elizabeth in which thirteen bears were used wrote:

> It was a sport very pleasant to see, to see the bear, with his pink eyes, tearing after his enemies approach; the nimbleness and wit of the dogs to take his advantage and the force and experience of the bear, again to avoid his assault; if he were bitten in one place how he would pinch in another to get free.

Samuel Pepys, however, who describes a visit to the Bear Garden on August 14, 1666, does not record such a favorable impression in his Diary. Pepys wrote, "after dinner, with my wife and Mercer to the Beare-Garden, where I have not been, I think, of many years and saw some sport of the bull's tossing the dogs: one into the very boxes. But it is a very rude and nasty pleasure."

The Puritans later attempted to put an end to the bear-baiting, but Macaulay suggested this effort was "not because it gave pain to the bear, but because it gave pleasure to the spectators." This sport flourished for centuries, but it was finally suppressed by an act of Parliament in 1835.

This patient who fell off the gallery later fell into good professional hands and Clowes by using various ointments and remedies, one the discovery of his old master Keble, ended the cure. The patient and his friends, however, were dissatisfied because the fractured leg was shorter than the other and "departed from me, being not well pleased for the shortness of his leg, and I much more discontented for their base minded paiment for the healing of so great and dangerous a cure." Every surgeon will sympathize with Clowes' feelings but at the same time reflect that Clowes was rather lucky since malpractice suits were not in vogue during Elizabeth's reign.

All of Clowes' observations are interesting, not merely from the surgical point of view, but because they give us such interesting views of life in the days of Queen Elizabeth. He treated a ship's master whose both legs were fractured "with an iron bullet, shot out of a great basse or harquebrisse of crocke at the sea, by a Pyrat or sea-rover," several patients wounded by swords or dagger wounds, and "the gunner of a ship, which was very dangerously wounded, into the lower region of the belly, so that a great part of the Zirbus, or Omentum, did come out of the wound, with some of the intestines and guts likewise."

Clowes' surgical methods were not very gentle. He was satisfied with any kind of union after fractures and was not disturbed by any shortening of the legs. In amputation of the legs he always wanted a strong man to hold the patient, "a man that is able to hould him fast by both his armes," and a man to hold the patient's leg above the incision, "he that doth so hould should have a large hand and a good gripe, whose hand may the better stay the bleeding." Also, "in like manner there must be another skillful man that hath good experience and knowledge to hold the legge below."

Clowes in his last two chapters gives a list of surgical instruments "good for young practisers of Chirurgerie to be furnished with, which follow the wars either by sea or land and some remedies for wounds in generall, but specially for wounds with gun-shot."

Clowes thought a well-furnished surgical chest was a very necessary part of every surgeon's equipment and complains that some surgeons are "with a little chirurgerie stuffe in budgets and bagges being very unfit furniture to serve in her Majesties service." The 1596 edition of his surgery shows an illustration of a surgeon's chest as shown in Figure 6.

As Clowes finishes his "Profitable and Necessarie Booke" he cannot resist the Muse and after a page of verse closes:

Hippocrates in his Aphorisms, as Galen writeth sure,
Saith, foure things are needfull to every kind of cure,
The first, saith he, to God belongeth the chiefest part,
The second to the Surgeon, who doth apply the art,
The third unto the medicine, that is dame Natures friend
The fourth unto the patient, with whom I here will end.
How then may a Surgeon appoint a time, day or houre,
When three parts of a cure are quite without his powre,
All these things should be observed by surgeons as their vowes:
I wish we all could follow this, finis
William Clowes.

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JOHN LOCKE

PHYSICIAN AND PHILOSOPHER

By JAMES HERBERT DEMPSTER, B.A., M.D.

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Part 1*

> Among the great men of the seventeenth century not one has more enduring claims to our grateful remembrance than John Locke—philosopher, philanthropist and physician. As a philosopher his praise is in the colleges. As the apostle of common sense he may be ranked with Socrates and a few others who have brought philosophy from the clouds to the working day world.
>
> —Sir William Osler.

I

The Setting

ALTHOUGH a man may have personal qualities to place him in that small class who are "not of an age but for all time," as had John Locke, yet he is influenced by the age in which he lives. The *Zeitgeist* has its effect upon him and we may adequately appreciate him and understand his problems only if we know something of his times and his contemporaries. The seventeenth century was one of the most virile periods of history. It was the period when Newton, Huygens, Galilei, and Kepler laid the foundations of modern astronomy and physics; and Robert Boyle made chemistry a science. The biologists Grew, Ray, Leewenhoek, Hooke and Malpighi made contributions of vast importance during this century. The seventeenth century was the time when the post-Vesalian anatomists were active in describing parts of the human body which even now bear their names. Puritanism itself produced many strong men among whom may be mentioned the author of "Paradise Lost," John Milton, who was ever active in the cause of freedom.

As contemporaries of these men, the medical triumvirate: Harvey, the founder of modern medicine; Sydenham, the great clinician, and John Locke, the founder of experimental psychology, have not suffered by comparison. The lives of the three were to a certain extent contemporaneous. Locke was twenty-five years old and Sydenham thirty-three when Harvey died. Both should have been familiar with Harvey's great work, "De Motu Cordis," which was published in 1628, but there is no evidence that either had ever read it.

If we were to give Locke's chronological relation to the philosophers of his time it would run somewhat as follows: The English philosopher Thomas Hobbes was forty-four years old when Locke was born. Spinoza, the Dutch Jewish philosopher, was born the same year as Locke (1632) The French materialist Descartes was thirty-six years old and John Milton, the poet, twenty-four in this year. Berkley was twenty years old and Voltaire ten when Locke died in 1704. Hume, the Scottish, and Kant, the German, idealistic philosopher were born respectively seven and twenty years after Locke's death. As shall be seen, while not a follower of

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*To be completed in two parts.

Descartes, Locke was influenced towards independent study by him more than by any others.

FIG. 1. JOHN LOCKE. FROM THE PORTRAIT IN THE NATIONAL PORTRAIT GALLERY, LONDON.

At the accession of James I in 1603 the doctrine of the divine right of kings had not yet been challenged. Long before Locke's death the power of parliament was supreme. This was an age of discovery and voyaging. Puritanism had reached its greatest aggressiveness, though earlier in the seventeenth century emigration of Puritans to America had taken place in large numbers. The span of years during which John Locke lived included four years of Civil War followed by the execution of Charles I and the establishment of the Commonwealth, during which time Oliver Cromwell was virtually dictator. The Restoration of 1660 marked the return of monarchial government. Then in 1688 occurred one of the epochal events of English history when the crown and parliament became partners, with the parliament the leading partner. Henceforth the right to the English crown rested on Act of Parliament. During the century there was a gradual evolution of civil and religious liberty in which Locke might have unboastingly affirmed "quorum magna pars fui."

FIG. 2. JOHN LOCKE. "G. KNELLER, EQUES. PINXIT 1697. IN THE POSSESSION OF THE REVD. DR. WM. GEEKIE G. VERTUE SCULP. 1738."

It is difficult to form any adequate conception of social England before the industrial revolution which received its final impetus with the perfecting of the steam engine near the end of the eighteenth century. Up to that time we may assume England to have been a land of greater or less contentment where the extremes of wealth and poverty were not known as today.

A time there was ere England's grief began,
When every rood of ground maintained its man.

Fig. 3. Robert Boyle, Friend of John Locke.

With the discovery of the new world colonization had come to occupy the minds of the people with a beginning commerce. England of the Middle Ages, however, must have been populous and of necessity self-contained so far at least as the staple articles of food were concerned. In the seventeenth century London was the largest city, as it still is, in Great Britain; the population in 1700 was about half a million. Urbanization had not yet become a custom, for industries were for the most part household manufactures which could be carried on advantageously in villages and towns remote from the larger centers of population. The huge cathedrals which are to be found in almost every town in England testify to a numerous and church-going population. They could not be built today by the comparatively few people who attend them. Today the traveller in the British Isles is impressed with the amount of land that is out of cultivation. Before the age of discovery and colonization and foreign trade the cultivation of this land must have been a necessity, to sustain the population.

Christopher Dawson in a recent work[1] declares that the doctrine of progress was first clearly formulated by Abbe de St. Pierre after the close of the war of the Spanish Succession (Treaty of Utrecht, 1731). Since that time the idea of progress has dominated the western mind. To question it today would be rank heresy. Locke, however, lived in an age which was to a large extent static. Transportation was confined to muscle drawn vehicles and to sailing vessels. As a result the great majority of the people travelled but little or not at all. In both Europe and America means of locomotion were so primitive and roads so bad that provincialism not only in language but in ideas as well prevailed. As for means of communication such as existed were as limited as the means of transportation. Even to the beginning of the nineteenth century not much progress in means of communication was made. It took four days for the news of the defeat of Napoleon at Waterloo to reach London.

The early seventeenth century home, especially outside the congested portion of London, was beginning to be a place of comfort; particularly was this so in the homes of the wealthy. It was at this time that towns and cities began to take on increasing importance. The early seventeenth century well-to-do home had glazed windows, carved oak furniture, rich embroideries and panelled rooms. Stoves, however, were a convenience of the future and heating was done by great open fireplaces. Houses in England even at the present time depend largely upon the open fireplace for warmth and often these fireplaces are works of art. Many of the luxuries of today had their beginning during this period of history. For instance, clocks were to be found in many homes. In the century before this a clock was a rare and expensive luxury. The forerunner of the piano, namely, the spinet was found well suited to accompany sentimental songs.

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[1] Dawson, Christopher. Progress and Religion. London, Sheed & Ward, 1929.

Along with their beer and rum men in particular enjoyed their pipes and Virginian tobacco. Regarding the socializing effect of beer a seventeenth century contemporary of Locke writes:

> It is fragrant to the scent; it is most pleasant to the taste; the flowing and mantling of it with the verdant smile of it, is delightful to the sight; it is touching or feeling to the braine or heart, and to please the senses all, it provokes men to singing and mirth, which is contenting to the hearing. The speedy taking of it dothe comfort the heavy and troubled mind.

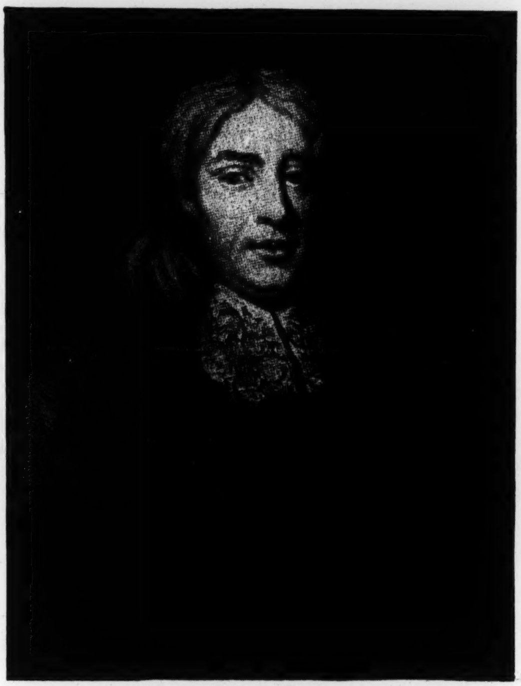
FIG. 4. THOMAS SYDENHAM.

The custom was to eat two meals a day and this prevailed up until the late seventeenth century. Coffee houses were a distinctive feature particularly in Old London and often here men would sip coffee and soothe their appetites until the main meals of the day. Early in the century, owing to expensive spirits, there was comparatively no hard drinking indulged in. Towards the end of the century, however, the home manufacture of gin was encouraged and the drinking habit spread. Drunkenness was rife. Spirit bars in Old London had signs inviting their patrons to become "drunk for one penny" and "dead drunk for twopence, with straw for nothing to sleep off the debauch."

The seventeenth century was the period of the two famous diarists, Samuel Pepys and John Evelyn. These men give us a more intimate account of the life of the times than seems possible to obtain from any formal history. Pepys' diary commenced on January 1, 1659, and was kept regularly for ten years. It was brought to a conclusion owing to failing sight of the author. Pepys had the habit of recording the most trifling occurrences of his life, and social existence is probably best seen in the trivial things that do not often find their way into history.

Sanitation is a very modern movement. History of the Middle Ages and up to the nineteenth century records vast epidemics that closed only with the annihilation of all susceptible individuals or the conference of immunity on the survivors. The City of London up to 1666, the date of the great fire, viewed at a distance was a city of churches with St. Paul's towering over all. Some of these may still be seen by the visiting tourist. Viewed at close quarters, however, London of the seventeenth century was not a thing of beauty. Neither the eye nor the nose found pleasure in it. The congestion was much worse than is to be found in any modern city even with its automobile traffic. Not only were the streets narrow but the Elizabethan houses were so built that their upper stories almost met, leaving a space of only a few feet for the sunlight to penetrate to the street below. The population of the poorer parts of the city lived in squalid tenements—a family to a room. Over it all was a heavy cloud of smoke, spoken of by Evelyn as "the hellish and dismal cloud of sea-coal," which caused London to resemble the "suburbs of hell." There is great variation of opinion as to the size of the population at this time. The estimate, for it can be no more than an estimate, ranges from 150,000 to 700,000 during the fourth decade of the century. One writer says that of sanitary decencies there were none. The filth of every household was thrown into the street. The air of the city was foul with the stench arising from exposed sewerage. The higher one got the purer the air, which calls to mind Dr. Samuel Johnson's argument for residence in an attic. Said he:

> I have discovered that invention and elocution suffer great impediments from dense and impure vapors and that the tenuity of a defecated air at proper distance from the surface of the earth accelerated the fancy, and sets at liberty those intellectual powers which were before shocked by too strong attraction and unable to expand themselves under the pressure of a gross atmosphere.

The country or the small village was as much a relief to the urban dweller in the seventeenth as it is in the twentieth century. Then the offensive feature was the noisome odors of putrescent sewerage, means for the disposal of which sanitary engineering had not yet devised; today we contend with the odor of the products of gasoline combustion and with the city noises. John Milton, the poet of Puritanism, expressed the sensation of relief from the odors of the city.

As one who long in populous city pent,
Where houses thick, and sewers annoy the air;
Forth issuing on a summer's morn to breath
Among the villages and farms
Adjourned, from each thing met receives delight.

During the seventeenth century, the year 1665 to be exact, occurred one of the most devastating plagues in Old London that any large city has suffered. This was checked in the following year by a fire that consumed the greater part of the city proper.

The seventeenth century was an age of superstition in common with centuries preceding it. It is interesting to note some of these as referred to in the work of Shakespeare. Their importance may be taken for granted when one sees how Shakespeare crowded his plays with such a large number of these popular fancies. For instance in the matter of anatomy the brain had three ventricles; memory, being the lowest, was the "warder of the brain" (Macbeth, Act I, Scene, vii), and when it was overcome as in drunkenness the reason became dethroned. The stomach and liver were the seat of courage. "Had all his hairs been lives my great revenge had stomach for them all," (Othello, Act v, Scene ii). The spleen was blamed for excesses, whether sorrow or joy.

In all the humors whether grave or mellow,
Thou'rt such a touchy, testy, pleasant fellow,
Hast so much wit and mirth and spleen about thee,
There is no living with thee, nor without thee.
—Addison, *Spectator* No. 68.

Poison might be administered by the ear as in the death of Hamlet's father. Literature of the Elizabethan age as well as that of the succeeding House of Stuart abounds in references to fairies. It was also an age of belief in witchcraft. Sorcery of all kinds was practiced. One cannot but be impressed by the many references by Shakespeare to astrology. "The fault, dear Brutus, is not in our stars, but in ourselves that we are underlings," (Julius Caesar, Act I, Scene ii).

It was an age of numerous bizarre curative agents and the housewife gathered herbs and other remedies to which great virtue was ascribed. Doubtless the numerous crude drugs used by the seventeenth century physician was a selection of household agents which were used almost entirely in an empirical way. Little wonder then if the materia medica of the day seems somewhat crude and irrational compared with the products of today's pharmacy. And even yet we have little reason to boast.

The condition of university education immediately preceding 1652 (the date on which Locke entered Oxford) is described as very much demoralized. Academical pursuits were virtually abandoned by all except a few real scholars. "Hunting, gambling, and debauchery were the pursuits of Charles the First's picked body of graduates and under-graduates," writes H. R. Fox Bourne,[1] and even after the worst of these had been weeded out, the residue was bad enough. For two or three years the most zealous efforts of puritan reformers seemed to be futile. In 1650 the visitors found it necessary, not for the first or last time, to bid the members of the University abstain from dressing and disporting themselves like cavaliers and French actors. Some governors and many preachers, who ought to have been examples as to their garb and dress, were more like persons of the inns or court or playhouses than such that were to deliver the oracles of God. Instead of short hair and collar bound with cassock, in a pulpit you might have beheld long powdered hair, large bands half shirts hanging out at their sleeves, and they themselves affecting nothing more ridiculous than starch band formality or prelatical cut. "The academical Debauchees," continues Fox Bourne, "had at any rate the merit of not being hypocrites." They made no pretense of virtue.

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[1] Fox Bourne, H. R. Life of John Locke. N. Y., Harper, 1878, Vol. I, Chap. ii.

Significant also of the condition of education at this ancient seat of learning is the following extract from the inaugural address of the dean of Christ Church and Vice-Chancellor of the University of Oxford.

> It is not only the character of the age that distracts us but another calamity to our literary establishments, which is daily becoming more conspicuous—the contempt, namely, of the sacred character of the law, and of the reverence due their ancestors, the watchful envy of malignants, the despised tears and sobs of our almost dying mother the University, and the detestable audacity and licentiousness, manifestly epicurean, beyond all the bounds of modesty and piety in which alas too many of the students indulge.

Later he said:

> For the first two years we were a mere rabble, our critical situation and our common interests were discussed in the Journals and newspapers, by the most ignorant and despicable. Such was the pitch of madness that to have stood up for a gownsman would have been reckoned a violation of religion and piety.

The condition of education had become so bad that some extreme puritans maintained that all learning was bad except that to be obtained from a study of the Bible and Thomas Hobbes advocated the suppression of universities altogether. A movement to carry out Hobbes' idea was introduced in the Barebones parliament but failed to carry. The status of education, however, was in the nature of the darkness that comes before the dawn, which was to be the work of individuals rather than corporate institutions of higher learning. The work of lone scholars living and laboring apart from schools and colleges has characterized British thought. Numerous names will at once suggest themselves: Harvey, Sydenham, Locke, the Hunters, in medicine; Hobbes, Locke, Hume, in political and mental philosophy; Newton in physics and astronomy; Boyle in chemistry, Bentham and Adam Smith in politics and economics.

Seventeenth century England was finding herself. It was a period when she shook loose the shackles of absolutism in government and gained to a large extent freedom in every department of human thought.

II

Youth and Education

John Locke had been known to the medical profession chiefly as a friend of Sydenham. In fact, Osler maintains that not until the appearance of Fox Bourne's "Life," had he been recognized as an active practitioner, though throughout his long career he was always ready to treat cases and to give medical advice. Not until the appearance of this biography was it generally known that he was a writer of medical essays and that he had left a large collection of clinical reports and case histories. His name is widely and justly associated in the minds of educated people with his "Essay Concerning Human Understanding." He is perhaps less widely known as a political philosopher and as the author of "A Treatise on Civil Government and an Essay on Toleration." Locke, however, always considered himself a physician. It was this profession for which he was especially trained. He practiced medicine to the extent that his health would permit. A valetudinarian, he was compelled at times to seek the benefits of favorable climate since the dampness of his native land was unfavorable to his chronic phthisis. Like many others trained and licensed to practice medicine, he was more widely known for his avocation than by the calling by which he gained his livelihood. Locke was a close friend as well as family physician of the noted English Hippocrates, Thomas Sydenham. He was fifty-eight years old before his famous "Essay on the Human Understanding" was given to the world. His literary output was virtually the work of the last fourteen years of his life.

On August twenty-ninth, 1632, John Locke was born at the little village of Wrington in Somersetshire. It is related that his mother was on a visit from her home at Pensford near Bristol to her parents at Wrington where she was taken unexpectedly in labor and was compelled to put up at a little cottage where her illustrious son was born. The house remained intact until the nineties of the last century when it was torn down, leaving nothing but a stone tablet in the nearby church which testifies the date and that John Locke was born in a house adjacent to the church. His father was a small landowner and attorney who inherited a patrimony which, in somewhat depleted condition, he eventually passed on to his son. John Locke senior was a strict but at the same time liberal minded puritan who fought on the parliamentary side in the Civil War. Little is known of Locke's childhood further than the fact that it was passed mainly at Pensford, with occasional visits to his mother's relatives at Wrington. The Lockes had two children; the other, Thomas, who died at a comparatively early age, was born at Pensford and was baptized on August ninth, 1637. Nothing much is recorded of Locke's mother further than the recollection of a friend to the effect that she was a pious woman and affectionate mother. Probably owing to her early death the impression on her illustrious offspring was not pronounced. In his omission of any extended reference to his mother's influence and in his wholehearted approval of his father's methods of training, Locke's attitude resembles that of his successor nearly two centuries later, namely John Stuart Mill. Locke always expressed himself as greatly indebted to his father for the favorable influences of his childhood. He regarded his father as a "man of parts" and always mentioned him with the greatest affection. His evaluation of his father's conduct towards him is interesting. The father's attitude during his boyhood days was one of severity, always keeping the son at a distance. This attitude relaxed as the boy grew to manhood when father and son became fast friends. The discipline though severe was not in any sense cruel. From his own treatment Locke generalized a relationship that he thought should prevail between parents and children. The authority of the father should be established as early as possible, "as soon as he is capable of submission and can understand in whose power he is. If you would have him in awe of you, imprint it in his infancy, and, as he approaches more to a man, admit him nearer to your familiarity; so shall you have him your obedient subject, as is fit, while he is a child, and your affectionate friend when he is a man." Liberty and indulgence according to Locke were harmful to children since judgment could be developed only by restraint and discipline.

At the age of fourteen years the boy was sent to the Westminister school. This school was founded during the fourth decade of the sixteenth century. Here Locke spent six years, which was a year longer than called for by the regular curriculum. Nothing of interest is recorded of Locke's behavior during this period of his education. The discipline of the school is said to have been strict. The curriculum during the commonwealth period included theological training and forms of religion together with more hearing of sermons and prayers. Attendance at prayers was the routine before six in the morning at which hour the regular school work began. The time from six o'clock in the morning until noon was spent in the study of Latin and Greek. Then two hours were allowed for dinner. However, since the actual process of alimentation required much less than this time, the remainder of the period was spent in such recreation as the reading of Latin manuscript in order to familiarize the student with mediaeval handwriting. After the noonday meal there was more Latin and more Greek. From three to four in the afternoon the students spent the time in the open air. From four o'clock it was more Latin and Greek. It must not be thought that the lives of these hapless boys were all monotony. The routine described occupied only the first four days of the week. "Fridays," we are told, "were set apart for repetitions, and Saturdays for Greek and Latin declamations." Evelyn wrote:[1]

> I heard and saw such exercises at the election of scholars at Westminister school to be sent to the University, in Latin, Greek, Hebrew and Arabic in themes and extemporary verses, as wonderfully astonished me in such youths, some of them not above twelve or thirteen years of age. Pity it is that what they attain here so ripely, they either do not retain or do not improve more considerably when they come to be men; though many of them do.

From the viewpoint of education, the training at Westminister school was not so bad as it might seem to the reader. Here was discipline; probably too much of it; and what more valuable training than a thorough knowledge of Greek and Roman literature. One cannot read even good translations of the classic Roman and Greek authors without feeling the mastering wisdom and beauty contained therein. What an advantage (too seldom a possession of the modern college graduate) to be able to read them fluently in the original languages.

John Locke profited by such training though he did not advise it as the best means of training the youth of his day. He left Westminister school after six years for Oxford.

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[1] The Diary of John Evelyn, May 13, 1661.

In 1652 Locke matriculated into Oxford University at which time he could speak Latin as fluently as his mother tongue. From a circle of comparative seclusion at Westminister, he found Oxford a larger and a somewhat boisterous world. Probably at no other period in England's history was there greater political strife, culminating as everyone knows with the execution of a king and a Civil War. Charles I had sought refuge in Oxford, which city had been made headquarters for the royalist forces. Many of the students served in Charles' army. During the Civil War the dean of Christ Church and vice-chancellor of the University was Dr. Samuel Fell, a rabid supporter of the royalist cause. Perhaps it is from his unreasonable partizan attitude that his unpopularity, which gave rise to the following rhyme, originated:

I do not love thee Doctor Fell,
The reason why I cannot tell;
But this alone I know full well,
I do not love thee Doctor Fell.

For his ardent espousal of the royalist party Dr. Fell was eventually deprived of his academic position. He was succeeded by Dr. Reynolds, whose position as dean of Christ Church College was doomed to be of short duration, for on being called within less than three years to pledge allegiance to Cromwell's government, he refused. On the eighteenth of March 1650, Dr. John Owen was appointed dean of Christ Church in his stead. Dr. Owen held the position during Locke's sojourn as student. In September, 1652, Owen was made vice-chancellor which made him master of the whole University. The depraved condition of university education was much improved under the rule of Owen and the more liberal puritans, so that Clarendon was constrained to declare that puritan rule

> . . . yielded a harvest of extraordinary good and sound knowledge in all parts of learning, and many who were wickedly introduced, applied themselves to the study of good learning and the practice of virtue; so that when it pleased God to bring King Charles II back to his throne, he found that University abounding in excellent learning, devoted to duty and obedience, and little inferior to what it was before its desolation.

Some say that mainly through Owen's influence the University had been transformed from a state of chaos to one of comparative order. When Locke, in 1655–56, had been awarded his Bachelor of Arts degree, England had well entered an era of republicanism.

When Locke entered Oxford in 1652 he was just twenty years old. Christ Church, the college of his choice, is said to have been the richest, the most influential of all the Oxford colleges. He was under the tutorship of one Thomas Cole about five or six years his senior and like himself a graduate of the Westminister school in London. Though dismissed for non-conformity in 1660, Cole was described as an amicable and tolerant man and an excellent scholar. Fortunate is the young man or woman who has a heretic as teacher, one whose enthusiasm for the truth is such that he is willing to sacrifice certainty and ease if need be. Locke's day was somewhat less strenuous than at the Westminister school, though he was required to attend College Chapel at five o'clock. Then following this early service was breakfast. His time between breakfast and the mid-day meal was taken up with University lectures or in preparation for them under the guidance of his tutor Mr. Cole. During dinner if there was any conversation at all, it was in Latin. After dinner and a second public lecture he was free to do as he pleased. He was expected to attend declamations in the afternoon but this was not compulsory. We imagine this rule was more honored in the breech than in the observance so far as Locke was concerned, for according to one of his friends, "Mr. Locke never learned the trade of disputing in public in the schools, but was always wont to declaim against it as being invented for wrangling or ostentation, rather than to discover truth."

Among the subjects of study that engaged his efforts might be mentioned grammar and rhetoric during his first year; during the second year, logic and philosophy; in the third year the course consisted of logic, moral philosophy and geometry and Greek. The fourth year was given up to lectures on all these subjects. Such was the work pursued for the degree of Bachelor of Arts which he obtained in 1556.

What Locke's reaction was to this scholastic program has been clearly declared by himself.

> I have seldom or never observed anyone to get the skill of reasoning well or speaking handsomely by studying those rules which pretend to teach it. Right reasoning is founded on something else than the predicaments and predicables, and does not consist in talking in mode and figure itself. If the use and end of right reasoning be to have right notions and a right judgment of things, to distinguish between truth and falsehood, right and wrong, and to act accordingly, be sure not to be bred up in the art and formality of disputing, either practising it himself or admiring it in others, unless instead of an able man, you desire to have him an insignificant wrangler, opinionator in discourse, and priding himself in contradicting others—or which is worse—questioning everything, and thinking there is no such thing as truth to be sought but only victory in disputing.[1]

Locke appears to have been much dissatisfied with the educational methods which prevailed during his time. He was discontented with school life and wished his father had mapped out some other career for him than that for which either the Westminister school or Oxford University could prepare him. He appeared to have stressed the importance of knowledge of the Greek language for he said. "No man can pass for a scholar that is ignorant of the Greek tongue." There is no doubt that a mind such as his derived a great deal more than was ever taught, from a study of Greek literature and philosophy, even though the teachers, to use a description by Carlyle,[2] of his own time, were "hide bound pedants without knowledge of man's nature, or boys; or ought save their lexicons and quarterly account books. Innumerable dead vocables (no dead language, for they themselves knew no language) they crammed into us, and called it fostering the growth of the mind. How can an inanimate mechanical gerund-grinder foster the growth of anything?" Locke realized that the Greeks laid the foundation of western culture.

After he was graduated Bachelor of Arts, in 1656, he proceeded to the degree of Master of Arts which was awarded him in 1658, one year less than the time usually required. Locke was granted a senior studentship at

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[1] Some Thoughts concerning Education.

[2] Carlyle, T. Sartor Resartus.

Christ Church College that he held until 1684.

According to Lady Masham, Locke was discouraged over the unprofitable reading expected of him and was disposed to seek the company of pleasant and witty men, "with whom he likewise took great delight in corresponding by letters, and in conversation and in these correspondences he, according to his own account of himself spent for some years much of his time." It is also related that, "Mr. Locke spent a good part of his first years at the University in the reading of romances, from his aversions to the disputations then in fashion there."

A fellow student describes him as a student as follows:

> This same John Locke was a man of turbulent spirit, clamorous and never contented; while the rest of our club took notes from the mouth of our master, who sat at the upper end of a long table, the said Locke scorned to do this, but was forever prating and troublesome.

The club referred to was for the purpose of studying chemistry under one Peter Staehl of Holland who was brought over to Oxford for the purpose of teaching this subject. Among the students or members of this club was Sir Christopher Wren, the famous architect. The fees for the course we are told were three pounds.

Locke kept the first regular journal of the weather, using a barometer, thermometer and hygrometer. His letters to Boyle contained numerous references to his speculations in chemistry and in medicine.

Regarding his studies and philosophical investigations, John Brown contends that they were prompted solely by the enthusiastic search for truth. "The 'Essay on Human Understanding' contains a larger quantity of facts about our minds, a greater amount of what everybody knows to be true, than any other book of the same nature. The reasonings may be now and then erroneous and imperfect but the ascertained truths remain and may be operated upon by all after comers."[3]

We have seen that Locke during his undergraduate course was somewhat irregular and rebellious as a student. He was never enthusiastic over the work at either Westminister or Oxford. This attitude on his part was a more valid criticism of the method of education that prevailed than it is an adverse reflection on himself as student. Often virile minds have revolted against the conservatism in education of their day. The fellow student described him as one who scorned to take notes of the lectures as did the rest of the class but evidently indulged in questioning the lecturer. He had to be shown. He had never learned to walk in harness. Locke's reaction to his alma mater was much the same as that of Thomas Carlyle, and Charles Darwin in more recent times. Schools even at the present time are designed too frequently for the average rather than for the exceptional student. Himself a victim of scholasticism, probably no other person has done so much towards affecting a reform in educational methods, not only of his own but of other nations as well. While university trained, Locke's work in after life, particularly in his later years, was accomplished more or less as an individualist. Like many other Englishmen who have made their contribution to knowledge he worked

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[1] Brown, John, Horae Subsecivae.

single handed. He was not connected with any university[1] or other institution of learning.

Locke felt that the time spent in the study of philosophy was unprofitable, "because," he said, "the only philosophy then known at Oxford was the peripatetic, perplexed and obscure terms and useless questions." It was his introduction to the works of Descartes[2] which gave him his first pleasant taste of philosophy. While differing from Descartes, he found his writings very intelligible, and for the first time Locke maintained his lack of understanding and appreciation was possibly due to the obscurity of these writers rather than his own inability to comprehend the subject. So he turned from the scholasticism of Aristotle to master all that appealed to him in the Cartesian school. Both moderns had a like experience in their undergraduate days. Descartes was also trained in the scholastic school of the Jesuits of his time. He said:

> As soon as I had completed all that course of study at the termination of which one is usually admitted into the ranks of the learned, I found myself embarrassed with so many doubts and errors, that, as it appeared to me, I had derived no other benefit from the pursuit of knowledge than this, that I had thoroughly discovered my own ignorance.[3]

Descartes laid his foundation for knowledge by doubting everything, but concluded that the being that was capable of such universal doubt could be sure of at least one thing and that was his own existence: *cogito ergo sum*. Locke, as will be seen, reduced the mind to a complete blank to begin with, *tabula rasa*, on which human experiences were to be written. Descartes set him thinking but it is too much to expect that such virile minds would continue to think along the same line. Descartes was the only person Locke ever recognized as a master in philosophy. He was much more; he was also considered the greatest of modern mathematicians up to the time of Newton. He was also a physiologist; according to Thomas Huxley, "He did as much for the physiology of motion and sensation as Harvey had done for the circulation of the blood, and opened up the road to the mechanical theory of these processes which has been followed up by all his successors."

Owen was dean of Christ Church College during the greater part of the period of the Commonwealth. With the Restoration of 1660, Owen was deposed and Oxford again came under the control of the traditional Stuart influence. Locke continued to be connected with Christ Church for about twenty-four years following the Restoration. During the earlier years of this period the time was passed as a tutor or lecturer. He became interested in the natural sciences, particularly chemistry, which turned his decision in favor of medicine about 1666 after some years of indecision as to whether it would be medicine or theology. The months of 1667 were mainly taken up with his academic work and his medical studies. During 1663 he studied under Staehl, a great chemist of the time who came from Holland to instruct small private groups of students at Oxford. The years between 1660 and the year 1665 had been spent in diplomatic work as secretary to Sir Walter Vane on the continent. On his return to England he entered on the study of medicine with renewed interest. It is understood that he had already given considerable time to it before his final resolve to enter medicine as a life career.

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[1] While Locke was connected with Oxford University in the capacity mentioned for a number of years, his real work in philosophy embodied in the "Essay Concerning Human Understanding" was not published until 1690. It was evidently not the outgrowth of any connection with his alma mater. The same might also be said of his "Treatise on Civil Government."

[2] Rene Descartes (1596–1650) was an intellectual Frenchman who craved seclusion. He was evidently a very popular bachelor. He settled in Holland to avoid acquaintances and to live with philosophy. During the two decades preceding his death he lived in thirteen different places and twenty-four different homes. He was known only to a few intimates who respected his wishes. Descartes was an intellectual radical having little regard for the great men of the past. He wrote and experimented in physiology and judged in the light of his time his knowledge of physiology was extensive. It was a mechanistic physiology.

[3] From Descartes' "Discourse on Method."

III

MEDICAL STUDIES

It is not definitely known when Locke began to study medicine seriously, for his embracing medicine was as irregular so far as the University was concerned as some of his other endeavors in the way of education. He was not an ordinary student who works by definite schedule. Time tables and compulsory attendance at lectures are designed for the ordinary person to which class he did not belong. He failed to comply with even the slight requirements regarding medical education which prevailed at Oxford during this time.

All that was expected from an applicant for a bachelorship in physic was regular attendance for three years at the lectures of the Arabic professor and the professors of Anatomy and Medicine, together with participation in a certain number of disputations in the medical school, and after that little more than a delay of four years was necessary to qualify him for the doctorship.[1]

The lectures in medicine even as recent as the seventeenth century, consisted of an exposition of the works of Galen and Hippocrates. Though Harvey's great work was published in 1628, it had not yet made its way into the universities as a textbook. Sydenham the English clinician exerted great influence on Locke but this was after his student days. The course in anatomy consisted of a complete dissection of the human body and a course of four lectures each two hours in length. The human skeleton was taught in three lectures. There seems little doubt that at this time anatomy was further advanced than clinical medicine. "The teaching provided in the schools," writes his biographer Fox Bourne, "was nearly as useless in the education of competent doctors as were Latin verse writing and Aristotelian disputation in the education of useful politicians and sensible clergymen."[2] However, we are inclined to be generous for the same criticism might be advanced against the medical education of more recent times within the memories of men still living.

Dr. Fell was restored to the position of Vice-Chancellor of Oxford following the Restoration of the Stuarts. Had Dr. Owen and the administration of the Cromwellian period been in control, Locke's petition for the doctorship in medicine might have been allowed. The high Church party was now dominant at Oxford and Locke was certainly a *persona non grata* to this party. Through the aid of the Earl of Clarendon, however, in 1666 and again in 1670 he attempted to get the degrees of M.B. and M.D. at Oxford without going through the regular course of study. On November 3, 1666 the Chancellor of Oxford University wrote the following letter in Locke's behalf:

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[1] Fox Bourne, H. R. Life of John Locke. N. Y., Harper, 1878, Vol. 1.

[2] Fox Bourne, H. R. Life of John Locke. N. Y. Harper, 1878, Vol. 1.

> Mr. Vice-Chancellor and Gentlemen:—
>
> I am very well assured that Mr. John Locke a Master of Arts and student of Christ Church, has employed his time in the study of physic to so good purpose that he is in all respects qualified for the degree of doctor in the faculty, for which he has also full time; but not having taken the degree of bachelor of physic, he has desired that he may be dispensed with to accumulate that degree, which appears to me a very modest and reasonable request, he professing himself ready to perform the exercise for both degrees. I therefore very willingly give my consent that a dispensation to that purpose be propounded for him.
>
> Mr. Chancellor and Gentlemen,
> Your very affectionate servant,
> Clarendon.

A man of liberal views who had besides written in praise of Cromwell could expect no favors from the high church part in control at Oxford. Locke was refused the request and it was not until February, 1675, that he took the M.B. degree after having fulfilled all requirements.

Though Locke was what might be called an unqualified practitioner (seeing that he had not the M.D. degree) he was held in the highest esteem by the best of his contemporaries, such men as Sydenham, Richard Lower and Willis. "He knew what he was about in physic and pursued the art with the tact and learning of a practical man as well as a farseeing philosopher.[1]

For thirty-nine years, however, Sydenham's only degree was M.B. Locke in his Latin notes speaks of himself as "*Medicus*" and to his colleagues as "*alii medici.*" Sydenham asked him to write a preface to his works and called him to treat his son, showing that he looked upon Locke as a colleague and equal rather than disciple.

In Locke's day it was not absolutely necessary for a man to be an M.D. to practice physic, though the majority of the higher class of physicians graduated from the University in physic and afterwards became connected with the Royal College of Physicians of London. No amount of influence, however, could move the stubborn University to confer upon him the coveted M.D. degree. However, without it he became the associate of Sydenham, assisting him in his practice and taking charge of his smallpox patients. He endorsed Sydenham's new methods of treating the disease. According to Fox Bourne he treated many cases after 1667, among them dropsy, bronchitis, hysteria and rheumatism, erysipelas, lues venerea, kidney disease, stricture and fever.

Locke's academic career is recorded in the annals of the University of Oxford as follows: "Locke, John, gent, Christ Church, matriculated, 27 Nov., 1652; B.A. 14 Feb., 1655–6; M.A. 29 June, 1658; M.B. 6 Feb., 1674–5; Greek lecturer at Christ Church 1661; reader in rhetoric, 1662; censor of moral philosophy, 1663."

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[1] Richardson, B. W., John Locke. *Asclepiad,* 10: 165–195, 1893, p. 170.

He had evidently also decided to fulfil the university requirements to obtain the M.D. degree but ill health induced him to leave England. He remained abroad until 1679. Sydenham wrote him on the matter of his physical condition. "It will be highly necessary that you cherish yourself as much as possibly you can by going to bed very early at night, even at 8 o'clock, which next to keeping bed, which is impracticable, will contribute more to your relief more than can be imagined."

During his years of absence from England he lived chiefly at Montpellier where he took a great interest in the celebrated medical school there. Locke went to Montpellier in 1675 for his health and likewise to pursue his medical studies since Montpellier contained the most famous medical school of the time. During his residence abroad he kept a diary. From it the following account of the annual graduation of doctors is taken. The manner of making a doctor of physic is this:

> 1st a procession in scarlet robes and black caps—the professor took his seat—and after a company of fiddlers had played a certain tune, he made them a sign to halt, that he might have an opportunity to entertain the company, which he did in a speech against innovations—the musicians then took their turn. The inceptor or candidate then begun his speech, wherein I found little edification being chiefly complimentary to the chancellor and professors who were present. The doctor then put on his head the cap that had marched on the beadle's staff, in sign of his doctorship—put a ring upon his finger—girt himself about the loins with a gold chain—made him sit down beside him—that having taken pains he might now take ease and kissed and embraced him in token of the friendship which ought to be amongst them.

During the latter half of 1666 Locke was junior partner to his old friend David Thomas, who practiced medicine at Oxford. They practiced physic and during their spare-time occupied themselves with chemical experiments as well as the collection ad study of drugs under the direction of Boyle.[1] During February (1667) Locke and Boyle spent much of their time in the collection of botanical drugs. Parenthetically it may be said that Boyle's influence upon Locke was most pronounced. Their early acquaintance ripened into a friendship which lasted until Boyle's death in 1691.

Regarding Locke's medical career and the esteem in which he was held by the best medical minds of the time Le Clerc[2] writes:

> And thus beginning afresh to Study, and more earnestly than he did before, he applied himself particularly to Medi-

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[1] Robert Boyle (1627–1691), the English physicist, published in 1660 his "New Experiments Physico-Mechanical Touching the Spring of Air and its Effects." He was author of the physical law that the volume of a gas varies inversely as the pressure, commonly known as Boyle's Law. He put into practice the principles of Bacon's "Novum Organum." Chemistry was his favorite study. Boyle was the first to distinguish between mixtures and chemical compounds, showing that the latter usually possessed different properties from those of their constituent elements.

[2] Jean Le Clerc was Locke's first biographer. He was born in Geneva in 1657. He was well educated in the classical, theological and philosophical learning of his day. Concerning Locke and Le Clerc, Bourne writes, "There was a difference of twenty-five years between the ages of the two men, but Le Clerc's quicker if less profound wit made him the contemporary of Locke and even in some small measure his guide." They did not meet, however, until 1686. The extract quoted is from a translation from Le Clerc's Life and Character of Mr. John Locke which appeared in French.

cine, tho' this never turn'd to his own Profit, because he did not find that he had a Constitution of Body strong enough to bear those Fatigues, to which they are necessarily exposed, who would have any considerable Practice. But tho' he never practis'd Physick, he was in great esteem, with the most able Physicians of his Time: We have a clear Proof of this in the Dedication of an excellent Book, De morbis acutis, put out in the Year 1675, by the famous Dr. Thomas Sydenham, where he speaks to this Purpose; besides you know, that my Method hath been approv'd by one, who hath examin'd it thoroughly, and who is our common Friend, I mean, Mr. John Locke, who whether we respect his Wit, or his piercing and exact Judgment, or whether we look to his prudent and regular Behavior, there is no Person in our Age that excels him, and there are but a few that are his equals. This was the Opinion of one of the greatest Practitioners in Physick, and one of the honestest Men, that London had in the last Age.

Considering the fact that the acquaintance began as late as 1686, Le Clerc's statement "tho' he never practis'd physic," may be doubted. Locke has left notes and descriptions of interesting cases not to mention the celebrated patient Lord Ashley that indicate that he had spent much time and effort in the practice of his profession.

IV

Locke and Sydenham[1]

Two physicians held in about equal esteem by Locke were Thomas Sydenham and John Mapletoft. The name Sydenham, however, has meant a great deal more to future generations of doctors than that of Mapletoft. Sydenham obtained his degree in medicine at Cambridge University in 1667 and located in London about the time that Locke went to live at Exeter House on the Strand. Mapletoft is said to have introduced Locke to Sydenham who was his senior by eight years. Sydenham entered Magdalen College, Oxford in 1642 but did not remain long as he was in no sense a Royalist. Sydenham was a Roundhead in every sense of the term. He resumed the study of medicine, however, soon after the Restoration. He decided to study medicine on the advice of Thomas Cox. Sydenham wrote in 1675:

> It is not thirty years since I had the good fortune to fall in with Dr. Thomas Cox. I was on my way to London with the intention of going thence to Oxford, from which the breaking out of the war had kept me for some years. Dr. Cox asked me what calling I intended to follow. Upon this point my mind was undecided, and I had not even dreamt of medicine; but moved by the advice and encouragement of so great a man I applied myself seriously in that pursuit and certainly whatever praise my labors have received from the public is to be gratefully referred to the patron and promoter of my first endeavours.[2]

In 1646 Sydenham began to study medicine anew and was graduated with the degree of Bachelor of Medicine in 1648. After leaving Oxford he studied at the great French School of Medicine at Montpellier. Returning to London he was made a licentiate of the London College of physicians in 1663. He did not obtain his Doctor's degree, however, until 1676 when it was conferred upon him by the University of Cambridge. We see then that Sydenham practiced nearly twenty-eight years with the degree of Bachelor of Medicine which was the only medical degree that Locke ever held. In 1666 Sydenham published his first edition of his "Methodus Curandi Febres." Locke was greatly impressed with this work and made a close study of it. The intimate acquaintance of the two men began in 1667 and their friendship lasted until Sydenham's death in 1689. Sydenham's influence on Locke appeared to be in the way of inducing him to put his knowledge of medicine into practice.

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[1] This chapter deals with the professional career of Thomas Sydenham only so far as the mutual influence of the two friends is concerned. For a fuller account of Sydenham the reader is referred to the interesting little book by David Reisman, published by Paul B. Hoeber, Inc., 1926.

[2] Observationes Medicae (1676).

The student of history will recall that the year 1665 was that of the great plague which threatened to destroy a great part of the population of London. In 1666 occurred the great fire which reduced to ashes a large portion of the old city. The fire was in a sense a blessing in disguise in as much as the sanitary conditions of the city at the time were indescribably bad. Over one hundred thousand persons were reported to have died in 1665. In 1666 two thousand deaths were reported with only thirty-five the following year. Though great anatomists and physiologists had appeared before this time not much had been accomplished in the way of applying their discoveries to the curative art and to sanitation. Preventive medicine can scarcely be said to have existed in any sense at this time. The belief that disease was the work of the devil still prevailed among the vast majority of the people. The few excellent physicians of the time were in no way able to cope with the superstition of the multitude and they were almost powerless to deal in any effective way with the plague.

In 1668 Sydenham wrote to Boyle:

> I have the happiness of curing my patients, at least of having it said concerning me that few miscarry under me; but cannot brag of my correspondency with some of my faculty, who impeach me of great insufficiency; though yet, in taking fire at my attempts to reduce practice to a greater easiness and plainness, and in the meantime letting the mountebank at Charing Cross pass unrailed at, they contradict themselves, and would make the world believe I may prove more considerable than they would have me. I perceive my friend Mr. Locke hath troubled you with an account of my practice, as he hath done himself in visiting with me very many of my variolous patients especially.

This reaction towards Sydenham on the part of the medical profession of his day shows a lack of cooperation in any great movement which would tend to mitigate the ravages of the plague.

Smallpox is today a disease that is under perfect control where people have the sense to use the means of immunization. It was, however, a formidable scourge in the seventeenth century. Smallpox was one of the diseases to which both Locke and Sydenham gave particular attention. Regarding the dedication to Mapletoft (1676) of his great work, "The Method of Curing Fevers," Sydenham writes:

> You know how thoroughly my method is approved of by an intimate and common friend of ours, and one who had closely and exhaustively examined the subject—I mean Mr. Locke, a man whom, in the acuteness of his intellect, in the steadiness of his judgment, and in the simplicity, that is, in the excellence, of his manners, I confidently declare to

have amongst the men of our own time few equals and no superior.

Elsewhere is given an account of some of the diseases which Locke felt himself competent to treat. He has left notes that are somewhat fragmentary but quite in keeping with the recording of much of his philosophical writings. In his writing he seems to have taken but little thought of posterity. His works were written more as an exercise for himself rather than the thought of future publication. Writing was to him a means of defining and clarifying his own thoughts. The first chapter of a contemplated work dated 1669 with the title, "Ars Medica,"[1] indicates the practical view Locke took of the science and art of medicine. It shows that he was applying the same rational effort to the solution of medical problems that he did to psychological matters in his "Essay Concerning the Human Understanding." The extract is presented so clearly that I give it here without comment.

De Arte Medicae.

Length of life, with freedom from infirmity and pain, as much as the constitution of our frail composure is capable of, is of so great concernment to mankind that there can scarce be found any greater undertaking than the profession to cure diseases, nor is there any art that so well deserves all the care and industry of its professors to improve it and bring it to perfection, which I doubt not but in many parts and to a great degree it is capable of. He that shall go about to do this shall, no question, deserve the thanks of mankind for so good an intention as the reducing those rules and methods to a certainty, on the practice whereof the care and recovery of sick men depends; but whoever shall think to compass it alone will find himself engaged in a business too large for any one man's comprehension and too engaged in a business too great for his own single endeavours. My intention therefore is to propose some few things to the consideration of the learned men of this so useful a faculty, and to excite their mutual assistance to perfect the art and establish a settled certain practice in the cure of sicknesses, that so large catalogue of yet incurable diseases and the frequent sad events of the rest being every day lessened, the diffidence which some sober men upon serious consideration seem to have of the art itself, and the disrepute which others industriously labor to bring upon the practice of physic, being by the daily growing success of the physicians removed, the industrious and learned practitioners of physic (may) with more confidence and satisfaction attend their calling, when they could be no longer upbraided with those confessed opprobia medicorum which every day yield to the efficacy of their medicines or well-ordered methods.

If this were once set about, it would not perhaps be found so impossible a design as it is at first sight imagined; and the great improvements some parts of medicine have received within this few years give me confidence to believe that it is yet capable of great additions, and that in a way something different from hitherto seems to have been generally followed by most of those who have been so kind as to propagate the knowledge of physic and leave the rules of practice to posterity, as will appear to any one who shall carefully peruse their writings, wherein yet they have very much obliged posterity. And they are not to be blamed that they did that which is very agreeable to the nature of man's understanding; which, not contenting itself to observe the operation of nature and the event of things, is very inquisitive after their cause, and is very restless and unquiet till in those things which it is conversant about it has framed to itself some hypothesis and laid a foundation whereon to establish all its reasonings. If, therefore, the learned men of former ages employed a great part of their time and thoughts in searching out the hidden causes of distempers, were curious in imagining the secret workmanship of nature and the several imperceptible tools wherewith she wrought, and, putting all these fancies together, fashioned to themselves systems and hypotheses, 'tis no more to be wondered at or censured that they accommodated themselves to the fashion of their times and countries, and so far complied with their most natural inclinations as to desire to have some basis to rest their thoughts upon, and some grounds to guide them in the practice of their art. Their being busy and subtile in disputing upon allowed principles was but to be employed in the way of fame and reputation and the learning valued in that age; and that their practice extended no farther than the sacred principles they believed in would permit, is no more to be admired than that we find no fair and lasting fabrics left to us by our ancestors upon narrow and unsound foundations.

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[1] Fox Bourne, H. R. Life of John Locke. N. Y., Harper, 1878, 1: 222–227.

I would not be thought here to censure the learned authors of former times, or disown the advantages they have left to posterity. To them we owe a great number of excellent observations and several ingenious discourses, and there is not any one rule to practice founded upon unbiased observation which I do not receive and submit to with veneration and acknowledgement; yet I think I may confidently affirm that the hypothesis which tied the long and elaborate discourses of the ancients, and suffered not their enquiries to extend themselves any farther than how the phenomena of diseases might be explained by those doctrines and the rules of practice accommodated to the received principles, has at last but confined and narrowed men's thoughts, amused their understanding with fine but useless speculation, and diverted their enquiries from the true and advantageous knowledge of things. The notions that have been raised into men's heads by remote speculative principles, though true, are like the curious imagery men sometimes see in the clouds, which they are pleased to call the heavens, which, though they are for the most part fantastical and at best but the accidental contexture of a mist, yet do really hinder the sight and shadow the prospect; and though these painted apparitions are raised by the sun, and seem the genuine offspring of the great fountain of light, yet they are really nothing but darkness and a cloud; and whosoever shall travel with his eye fixed on these, 'tis ten to one goes out of his way.

He that in physic shall lay down fundamental maxims, and, from thence drawing consequences and raising disputes, shall reduce it into the regular form of a science, has indeed done something to enlarge the art of talking and perhaps laid a foundation for endless disputes; but, if he hopes to bring men by such a system to the knowledge of the infirmities (of men's) bodies, the constitution, nature, signs, changes and history of diseases, with the safe and discreet way of their cure, takes much what a like course with him that should walk up and down in a thick wood, overgrown with briars and thorns, with a design to take a view and draw a map of the country. These speculative theorems do as little advantage the physic as food of men, and he that thinks that he came to be skilled in diseases by studying the doctrine of the humours, that the notions of obstruction and putrefaction assist him in the cure of fevers, or that by the acquaintance he has with sulphur and mercury he was led into this useful discovery that what medicines and regimen are as certain to kill the latter end of some fevers as they cure in others, may as rationally believe that his cook owes his skill in roasting and boiling to his study of the elements, and that his speculations about fire and water have taught him that the same seething liquor that boils the egg hard makes the hen tender.

The beginning and improvements of useful arts, and the assistance of human life, have all sprung from industry and observation. True knowledge grew first in the world by experience and rational operations, and, had this method been continued, and all men's thoughts been employed, to add their own trials to the observation of others, no question physic, as well as many other arts, had been in a far better condition than now it is; but proud man, not content with that knowledge he was capable of and was useful to him, would needs penetrate into the hidden causes of things, lay down principles and establish maxims to himself about the operations of nature, and then vainly expect that nature, or in truth God himself, should proceed according to those laws his maxims had prescribed him; whereas his narrow, weak faculties could reach no farther than the observation and memory of some few effects produced by visible and external causes, but in a way utterly out of the reach of his apprehension, it being perhaps no absurdity to think that this great and curious fabric of the world, the workmanship of the Almighty, cannot be perfectly comprehended to any understanding but his that made it. Man, still affecting something of a deity, laboured to make his imagination supply what his observations failed him in; and when he could not discover the principles and causes and methods of nature's workmanship, he would needs fashion all those out of his own thought, and make a world to himself, framed and governed by his own intelligence. This vanity spread itself into many useful parts of natural philosophy, and, by how much the more it seemed subtile, sublime, or learned, by so much the more it proved pernicious and hurtful by hindering the growth of practical knowledge. Thus the most acute and ingenious part of men being by custom and education engaged in empty speculations, the improvement of useful arts was left to the meaner sort of people, who had weaker parts and less opportunities to do it, and were therefore branded with the disgraceful name of mechanics. Hence it came to pass that the world was so filled with books and disputes; books multiplied without the increase of knowledge; the ages successively grew more learned without being wiser or happier, or, if the conveniences of human life chanced to be promoted by any new invention, men were not led to such happy discoveries by the conduct of philosophical speculations, but chance or well-designed experiments taught them to those who employed their time and thoughts about the works of nature more than the maxims of the schools.

Of this the ploughman, tanner, smith, baker, etc., are witnesses. The great inventions of powder and the loadstone, which have altered the whole affairs of mankind, are undeniable instances; so that those who had read and writ whole volumes of generation and corruption knew not the way to preserve or propagate the meanest species of creatures; he that could dispute learnedly of nutrition, concoction and assimilation, was beholding yet to the cook and the good housewife for a wholesome and savoury meal; and whoever desired to to have fair gardens and fruitful fields had more reason to consult the experience of the dull ploughman and unread gardener than the profound philosopher or acute disputant. Let not any one be offended that I rank the cook and the farmer with the scholar and philosopher; for, speaking here of the knowledge of natural bodies, the end and benefit whereof can be no other than the advantages and conveniences of human life, all speculations in this subject, however curious or refined, or seeming profound and solid, if they teach not their followers to do something either better or in a shorter and easier way than otherwise they could, or else lead them to the discovery of some new and useful invention, deserve not the name of knowledge, or so much as the waste time of our idle hours to be thrown away upon such empty, idle philosophy. They that are studiously busy in the cultivating and adorning such dry barren notions are vigorously employed to little purpose, and might with as much reason have retrimmed, now they are men, the babies they made when they were children, as exchanged them for those empty impracticable notions that are but the puppets of men's fancies and imaginations, which, however dressed up, are, after forty years' handling, but puppets still, void of strength, use, or activity.

But, not to expatiate into the large field of natural philosophy, where perhaps the foundation of the mischief was first laid, I shall, according to my design, confine myself to that branch of it which immediately concerns the health of men; and, in physic, shall consider—

1. The present state of the faculty of medicine as it now stands, in reference to diseases and their cure.

2. The several degrees and steps whereby it grew to that height it is at present arrived to, which I suppose are these following—(1) experience; (2) method, founded upon philosophy and hypothesis; (3) botanics; (4) chemistry; (5) anatomy; in all which I shall endeavour to show how much each hath contributed to the advancing art of physic, and wherein they came short of perfecting it.

3. What yet may be further done towards the more speedy and certain cure of diseases; i.e., by what means and method the practice of physic may be brought nearer to perfection.

1. Diseases, as they lie under the regimen of physic, and receive more or less check from the application and methods of that art as it now stands, may fitly be divided into four sorts:

1. Such as are almost perfectly under the control of medicine, and do for the most part constantly yield to the skilful physician's hand, guided by the established rules of his art, and wherein he can at first sight, as far as is fit with submission to Providence and the great Disposer of men's lives, undertake the cure with assurance of a happy event; for it is not to be hoped that the meanest disease should always obey the skill of the ablest physician; nor would such a vanity be tolerable in weak, ignorant men, to pretend to be the disposers of health and life, that are the free gifts of Almighty God, which though his hand uncontrollably takes away or bestows where he pleases, yet he most commonly does it by the intervention of fit secondary means, and therefore I doubt not but a physician in some cases may with as little presumption assure a sick man of recovery as a mother undertakes to cure the hunger of her child, which is a disease too; but yet this he doth not by any power or authority of his own over the nature of things, but by a right application of those remedies which were ordained for the producing of such effects; medicines, rightly ordered, being as certain to recover some infirm bodies, as rabbits and chicken well dressed, to nourish others that are healthy, though perhaps some constitutions may be found with whom that kind even of wholesome diet will not at all agree. But yet, whoever has brought the cure of any disease near such a certainty as is the nourishment of a healthy man by any one kind of wholesome meat, may be allowed to be confident in his undertaking that species of distemper and in that part to have perfected the art of physic, though in some stubborn and irregular cases his well-constituted method should fail him, and the disease frustrate the whole success of his endeavours. And to such a degree of perfection as this I think I may confidently affirm the art of physic is arrived in many diseases which seldom stand out against the skilful attempts of good practitioners. Nor let the malice of prejudiced persons suggest here that these confident promises of health are not to be relied (on), but only in such diseases which of themselves leave us,

> wherein nature commonly works the cure without the assistance of art, and it may be with reason suspected the patient owed his recovery more to the vigour of his own constitution than the apothecary's drugs. Some diseases, like some weeds . . . [1]

An interesting fragment dated 1668 is entitled "Anatomica." Neither Locke nor Sydenham considered the subject of anatomy of the highest importance to the practitioner of medicine. In this fragment Locke makes the following statement:

> Anatomy, no question, is absolutely necessary to a surgeon, and to a physician who would direct a surgeon in incision, trepanning, and several other operations. But that anatomy is like to afford any great improvements to the practice of physic, or assist a man in the finding out and establishing a true method, I have reason to doubt. All that anatomy can do is to show us the gross and sensible parts of the body, or the vapid and dead juices, all which, after the most diligent search, will be no more able to direct a physician how to cure a disease than how to make a man, for, to remedy the defects of a part whose organical constitution, and that texture whereby it operates, he cannot possibly know, is alike hard as to make a part he knows not how is made.

A sentence in Sydenham's writing was found on the same page on which this quotation appears which presumably expresses Sydenham's attitude towards anatomy. It runs as follows:

> Others of them have more pompously and speciously persecuted the promoting of this art by searching into the bowels of dead and living creatures, as well sound as diseased, to find out the seeds of discharging them, but with how little success such endeavours have been and are like to be attended, I shall here in some measure make appear.

The fact that Locke and Sydenham had the temerity to make such statements must be attributed to the comparatively elementary state of anatomical knowledge of the time. Vesalius and Harvey had made discoveries which were left for their proper evaluation to men of later times.

Locke also wrote an article on "Tussis." He was the victim of a very troublesome cough most of his life, but the fragment is somewhat unsatisfactory as an adequate presentation of Locke's views on the subject.

Sydenham was noted for his cooling treatment and generous diet in the management of smallpox patients. He also employed Peruvian bark[2] in the treatment of agues, and laudanum in dysentery, gout and other diseases. One of Sydenham's great principles in the practice of his profession was that the physician's greatest duty was to aid rather than to thwart the course of nature.

Sydenham laid great stress upon the importance of "collecting as genuine and natural a description or history of diseases as can be procured," as basic to treatment. In obtaining "a natural history of disease every merely philosophical hypothesis should be set aside, and the manifest and natural phenomena, however minute, should be noted with the utmost exactness."[1] With this advice the wisdom of which, in spite of the development of laboratory methods, has not been excelled, we may pardon the writer's views on the place of anatomy in medical science. He maintained further that if one person in a generation had described accurately all the symptoms of a single disease, medicine would have been much further advanced than it was in his day. To this method of observation in its broadest sense Hippocrates and every great clinician since have owed their success. Sydenham recognized the *vis medicatrix naturae,* for he realized that nature alone often terminated diseases, that cures were often effected with simple medicines or with none at all. In this medical philosophy Sydenham felt particularly honored in the feeling that his methods had the endorsement of Locke.

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[1] Here the manuscript ends abruptly in the middle of a sentence. It is probably all he had to say on the subject.

[2] The therapeutic properties of Peruvian bark in the treatment of what has since come to be known as malaria, were discovered in 1631. Seven years later it was named after the Countess of Cinchon, wife of the Governor of Peru, who was cured of an attack of fever by the administration of an infusion of bark.

Locke in turn noted down everything, symptoms, methods of treatment, apparently for his own convenience without any thought of publication since he looked upon medicine as his life work. H. R. Fox Bourne makes the statement that out of his Journals, letters and other remains one might easily obtain enough material to make a volume illustrative of Locke's medical history. Not only did he study the symptoms and needs of his patients but we have carefully recorded his own physical history, even taking into account passing phases of malaise, a practice that today might dispose him to be classed a neurotic. In 1679 he reported an effective method employed by Sydenham of treating a woman who had repeated miscarriages. The same year a case of dermatitis is noted from the wearing of perfumed gloves. He condemns the habit of tight lacing, which prevailed at the time, as conducive to disease. Said he,

> I have seen so many instances of children receiving great harm from straight lacing, that I cannot but conclude there are other creatures as well as monkeys, who, little wiser than they, destroy their young ones by senseless fondness and too much embracing. Narrow breasts, short stinking breath, ill lungs and crookedness are the natural and almost constant effects of hard bodices and clothes that pinch.

He noted also in the same year (1679) an epidemic disease in London accompanied by violent cough "which produced a peripneumonia."

Sir Arthur Newsholme[2] quotes J. F. Payne's summary of Sydenham's contribution to medicine as follows:

> His great merit was to proclaim the great truth that science was, is and always must be incomplete; and that danger lurks in the natural tendency to act upon it as if it were complete. The practical man has to be guided not only by positive knowledge but by much that is imperfectly known. He must listen to the hints of nature as well as to her clear utterances.

There is evidence that John Locke had virtually subscribed to the same view of science.

V

A FAMOUS "CASE"

Hawthorn has written somewhere to the effect that we can be but partially acquainted with the circumstances that influence our course in life and determine our final destiny. Sometimes the circumstance is the influence of a great teacher or of a great clinician or of a man of philosophic outlook on life. John Locke met such an influence in the person of Lord Ashley with whom he became acquainted in a professional capacity in 1666. Lord Ashley,[1] who became later the first Earl of Shaftsbury, was a scholar as well as philosopher statesman. He may have had his faults, which history records, but history also bears out the fact that he exerted great influence on the political life of the middle seventeenth century. Charles II is said to have addressed him: "Ashley I believe you are the wickedest man in my kingdom," to which Ashley replied: "Speaking only of subjects, perhaps I am." It is rather amazing the liberties subjects of the time took with their sovereigns. The rare Ben Jonson, poet laureate, when given a miserable pittance by Charles II's father, replied; "His Majesty has sent me ten guineas because I am poor and live in an alley; go tell him that his soul lives in an alley."

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[1] From Brown, John. Horae Subsecivae, Paper on Locke and Sydenham (1861).

[2] Newsholme, Sir Arthur. Evolution of Preventive Medicine. Balt., Williams & Wilkins, 1927.

Shaftsbury is the Achitophel of Dryden's poem "Absalom and Achitophel," said to be the greatest combined poetical and political satire in the English language. Dryden brands the Earl of Shaftsbury as:

> A name to all succeeding ages curst;
> For close designs and crooked councils fit;
> Sagacious bold and turbulent of wit;
> A fiery soul, which working out its way,
> Fretted the pigmy body to decay,
> And o'er informed the tenement of clay.

It must be remembered, however, that Dryden belonged to the Royalist party and had very little or no sympathy with the Puritans. Dryden's estimate of Shaftsbury seems anything but fair, for, if for no other reason, the mutual attachment between Shaftsbury and Locke is in itself evidence that the Earl was a man very much out of the ordinary so far as ability and attainment are concerned. Through a fortuitous circumstance Locke became his physician. The first interview began what proved to be a long, congenial, as well as inspiring affinity. Shaftsbury was so favorably impressed with Locke's intellectual ability that he advised him, if he must continue to practice, to confine his work to the medical requirements of his immediate friends and to devote the powers of his mind to the study of the all-absorbing problems of state. Locke accepted the advice of his patron and as a result he gave to the world his work on civil government which influenced to a marked degree, as we shall see, the politics of not only England but also France and the United States.

Locke moved from Oxford to London where he became a member of the household of his famous patient whom he served as physician and literary factotum. He served also in various other capacities, one of which was the finding of a wife for Shaftsbury's son. While here, as we shall see later, at the instigation of Shaftsbury he drafted the fundamental constitution of the state of Carolina.

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[1] The practice of medicine and surgery was different during the late Middle Ages in many respects from what it is at the present time, When a surgeon undertook an operation, or a physician a case that did not require surgery, each stayed with his patient until he was cured. They were attached for the most part to the higher nobility to whom they charged large fees because, like the modern nurse, they could undertake a single case at a time. If their Lord were called to war they accompanied him, so that many of the medieval and early modern physicians and surgeons had experience in military service as well. After the fifteenth century, owing to the long era of peace following the Wars of the Roses, this custom gradually declined, though many instances of the personal physician are to be found to much later times.

In 1661 Ashley, or the Earl of Shaftsbury as he became later, sustained a fall which injured his chest, resulting in a lung abscess, an "imposthume in his breast," to use the language of Pepys. This purulent condition discharged eventually into the abdomen. Attending him in 1668, Locke made an opening into the abdomen for drainage. From that time on the patient continued to improve. To maintain drainage a sufficient length of time Locke inserted a silver tube, an early if not the first application of drainage to an abscess. It is said that Locke was much concerned over the problem as to whether the tube should remain permanently or whether the opening should be permitted to heal. It was finally decided that the tube should be left in the operative wound so long as there was any discharge of pus. Fox Bourne relates that "Satirists afterwards made great fun of Lord Ashley's silver tube. The silver tube, however, kept him alive to hear their satire."

Shaftsbury complained of attacks of abdominal pain beginning when he was eighteen years of age. These attacks were wont to come on about the middle of the day and to last about an hour. They were at times so severe that he was forced to lie down wherever he happened to be.

An operation, which consisted of opening up the abscess or empyema, was performed by Locke and drainage instituted as mentioned, with the result that the patient was cured of what Osler from Locke's notes has diagnosed as suppurating hydatid cyst of the liver.

The following is a translation of a Latin transcription of the case in Locke's handwriting[1] from a manuscript in the Record Office, London. Locke has gone into the history of this notable case very thoroughly.

The case of the most Noble Lord Ashley, Baron of Winburne, St. Giles, & c.—This most noble lord, aged 45, of very slight build and delicate constitution, had been an invalid for many years, and was exceedingly subject, upon the slightest cause, to a recurrent yellow jaundice. There was a painless internal tumour, broad, and slightly projecting, about the anterior region of the liver, and his hypochondria was very apparent to the touch. Although it had been observed 12 years before, the exact time when the tumour first began is uncertain. For since the colour of the skin was unchanged and no swelling was apparent externally, unless the hand were applied it easily escaped the eye; nor through the whole 12 years did it seem to change in the least. The doctors called into consultation on this point, amongst whom some from the excellent London College, were inclined to the opinion that this firm and unchanging extuberance was not a morbid tumour, but rather some congenital and unusual malformation of the liver. However the patient himself suspects, not without reason, that the tumour first came into existence in the year 1656, especially as at that time . . . he used to fatigue himself overmuch. By too frequent over exercise his blood became so heated that his skin would immediately be suffused with a deep redness, and his whole body seemed to be inflamed, all which gave rise to a burning fever. From this time on he was conscious of a complete change in the general condition of his body. Whereas before he was troubled more frequently with pains in the left side, and other splenic symptoms, from now on he escaped absolutely free from these troubles, and in their place acquired a constitution prone to other disorders and especially susceptible to morbus regius. From the prolonged languor brought on by this disease, when his emaciated body and impaired strength would threaten death, he was frequently restored by the timely use of acidulae, by means of which he obtained relief for one or two years, and was carried through so many vicissitudes of health, scarcely escaping with his life, until last summer. Then, happily, an internal abscess at last broke out, bringing to a head the source of so many disorders. There is one thing here which I cannot pass by, and that is that the patient's head never once ached though more than fatigued by disease. This, however, is not the only marvel displayed by that head.

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[1] This translation is here printed with the kind permission of the Clarendon Press, Oxford, England, publishers of Osler's "Alabama Student," in which the essay on John Locke appears.

During a bad night about the end of May, 1668, he was suddenly seized with excessive vomiting, accompanied by much disturbance. Everything he had eaten in the preceding meal was rejected, still raw and undigested, in repeated vomitings. He was purged next day by Dr. Glisson, the learned physician-in-ordinary. On the following morning he appeared discoloured a rusty red, which the physician tried to remedy with suitable drugs. But although the face seemed to return a little to its proper appearance, so that he could go about the ordinary duties of life, nevertheless, the languor and loss of appetite returned, anti-icterics and chalybeates being administered in vain. Moreover, about the beginning of June, since all the symptoms were running from bad to worse, the physician prescribed a purging pill to be taken at bedtime. When the patient raised himself up in bed to pass his urine about midnight he was suddenly seized about the region of the stomach and liver with a most acute pain which lasted the greater part of an hour and was finally relieved by resting comfortably in bed. When after an hour or two he again sat up in bed the same excruciating pain returned. Again one hour afterwards he got up, and in the same way when he raised himself upon his buttocks the pain attacked him for the third time, and after a like interval left him. Next morning at 8 o'clock, shortly after taking a purging potion he vomited it up mixed with viscid phlegm. After a while he left his bed, his servants taking him in their arms and placing him upright on his feet, so that his body should somewhere be bent. The cathartic had a satisfactory effect and he was purged. However, though he turned his body, he did not dare bend it, lest the severe pain should come on again. In the evening he began to suffer most acute pain in the back about the loins. This ceased after a quarter of an hour, and at the same time there suddenly sprung up below the ensiform cartilage a soft tumour the size of an ostrich egg. It was yielding to the touch, but on being compressed it did not for a moment retain any traces of the fingers. The skin was a brown (?) colour. There was hardly any pain, and no inflammation. This tumour could not be broken up by the drugs which were administered for six or seven days. Then physicians and surgeons were called into consultation and on June 12th it was opened by the application of cautery. This fact is worthy of observation: before the opening of the tumour a somewhat tenacious and flexible plaster fastened itself so firmly to the skin at the border of the tumour that it could not be torn away without leaving behind a large part of its substance; while, on the other hand, the top of the tumour, about the width of an English half-crown or more, was not even discoloured by it, nor was the plaster at all adherent in that part.

The daily record of the case is in English.

The 12th of June, 1668, in ye morning, a caustick was applied and ye same opened in ye afternoon, at wh. dressing besides a large quantity of purulent matter, many bags and skins came away. The like hapned the next day (being Saturday) both in ye fore and afternoon. On Sunday morning (being ye 14th) at ye first drawing out ye tent, a great quantity of yellow choler gushed out and two or three sluffs, wh some tollerable matter at ye latter end, for ye evening only a little matter came forth. And ye like on Monday both morning and evening.

On Tuesday morning a great quantity of matter came forth, with many bags to ye number of at least 80, for ye afternoon little of nothing, and so also on Wednesday.

On Thursday morning we had a new flux, both of matter and skin, in ye afternoon nothing considerable.

On Friday a wax candle was put deep into ye abscesse, and after ye drawing it out some matter and divers sluffs proceeded, in ye afternoon nothing.

20. On Saturday morning and evening some matter followed and above 10 bags. The passage could not be found.

21. On Sunday a wax candle put in of four and three-quarter inches and there left until evening, then drawn out without matter.

22. Monday morning. No running: a sponge tent put in for ye afternoon iii matter, bags above 20.

23. Tuesday morning. No running, i of infection for ye evening iii or iiii injection, part whereof wh. some matter came away and about 10 bags. About two hours after more came and so ye next morning, at my Lds. rising and about 10 bags at both times.

24. At ye dressing in ye morning, nothing came. Of injection v or vi, about three in ye afternoon a great flush brought away about 50 sluffs, whereof most were bags (but not red as formerly by reason of the injection) and some like jelley. At ye evening dressing no running. A glove thick spung tent left in ye orifice.

25. Morning. It ran of itselfe a little before dressing. Injection being made there came forth much thin digested looking matter, somewhat foetid with about 12 bags, whereof one very large. A spung tent put in. In ye evening injection, which came away next morning before dressing with four or five sluffs.

26. A Friday morning, injection was made & some thin matter came forth. A short spung tent put in: in ye afternoon some matter, no sluffs.

27. Upon ye drawing out ye spung tent matter followed with six or seven sluffs. O i injection being made whereof much stayed behind, in ye afternoon ye spung tent being pulled out, a great flush of matter followed, with almost 20 sluffs. O i injection was made whereof a great part staid in. A hemp tent was put in. Some matter came out in ye night & left a yellow tincture on ye cloths.

28. Pulling out ye tent, some yellow matter came out with three or four skins. A spung tent put in. The like issued in ye afternoon. O i injection was made & a flux tent put in.

29. It ran in ye night. Next morning after injection a flush of yellowish matter issued with 18 sluffs. A spung tent put in, after injection, whereof a considerable part remained. In ye afternoon upon ye drawing out ye spung tent, much matter gushed forth, being somewhat fetid, with 12 or 14 sluffs and bags. On injection being made ye same came freely forth tinctured with matter. A flex tent was put in.

30. In ye morning little matter came out, yellow tinctured, with one or two skins. A spung tent was put in. For ye afternoon a little matter, with two or three small sluffs. A flax tent put in.

July 1st. A Wednesday morning. After a second injection much yellow matter came forth with three or four yellow sluffs, & at last a considerable quantity of whitish well digested matter came out. A flax tent put in. At ye pulling out whereof in ye afternoon some thin matter proceeded & after injection more but little discolored & only two sluffs. A flax tent put in. My Ld. complained of a little paine, lower towards his right side.

2. Upon ye opening on Thursday morning, some little matter came away, but not fetid, rather of ye smell of wine, with one small sluff. A spung tent put in. In ye evening little came forth, no bags. A spung tent put in with one injection.

3. The spung tent being pulled out two yellow bags gushed out, without any considerable injected matter and afterwards five or six small sluffs with a little tinged liquor. Injection was made and spung tent put in.

4. Saturday morning. Upon pulling out ye tent little proceeded. After ye putting in ye small catheter & injection made considerable quantity of matter issued. A spung tent was put in; for ye afternoon a large quantity of well digested matter came out. No injection was made. A spung tent put in.

5. Yellow matter came forth with four or five sluffs, whereof one great one suckt into ye end of ye siphon. After injection a spung tent put in, wh. in ye afternoon being pulled out a good quantity of matter followed, well digested, especially through ye small catheter and siphon. A few sluffs came out, one great one. A spung tent put in.

6. In ye morning ye small catheter & siphon were put in; divers sluffs, some after injections, came forth, whereof three or four large ones. A hollow tent was put in upon ye pulling out whereof a sluff came forth, with divers very little ones; more seemed to stop ye passage but could not issue, because ye thinner parts did run out before through ye hollow pipe. Neither did injection promote their coming forth, though some matter of a brownish colour came out.

7. Much yellow matter run in ye night and some more this morning, with two or three sluffs. Injection was made, whereof ye greatest part came forth. A spung tent was put in. At night a sluff stuck to ye tent at it pulling out & 4 or 5 more where 2 very yellow came afterwards. No injection. A silver hollow tent put in.

8. It run very much in ye night, ye napkin was stained with yellow and green, one bag. A spung tent put in. In ye evening 4 or 5 sluffs, some matter. An open pipe put in.

9. Little run all night and sluff stopt ye pipe. One or two more followed, a considerable quantity of atheromatous matter. At night two sluffs; very little atheromatous matter.

10. A great running through ye hollow pipe, two or three sluffs. The matter at last being whiter and more even than before. Much running till night. Some sluffs. Injection made and a hollow pipe put in, after most of ye injection was discharged. After this a pain supervened in my Ld's. back about ye region of his liver, & at night he vomited; and had a cold shivering; wh. seemed to proceed from somewhat too liberal diet that day & catching some cold.

11. After a little sweat in ye morning, my Ld. was better. He was not drest till ye afternoon: ye ulcer having much discharged itselfe in ye meantime; wth some few sluffs.

12. A little matter with few sluffs. Injection made. A hollow pipe. At night run very little. Two sluffs.

13. Not drest in ye morning. Ran much. At night little matter, 2 or 3 sluffs.

14. It ran much yellowish gleet and matter in ye night. But upon ye opening no matter nor sluffs issued, though injection were made. At night one yellow sluff & little good whitish matter.

15. In ye night it ran much yellow matter & about six small sluffs. Injection made. No meeting in ye afternoon.

16. Upon opening much running of yellow matter appeared, with 4 or 5 yellow sluffs.

17. A large flux of yellow liquid, with 4 or 5 yellow sluffs, whereof two large ones sticking in ye pipe. Injection made.

18. It has run somewhat copiously before dressing, wth ye ejection of one

very small yellow bag. Injection being made brought forth some matter & a considerable quantity of very yellow liquid.

19. Little running before dressing, after it none, no injection.

20. Small quantity (?) of lesse yellow liquor run before dressing, 4 or 3 sluffs. Injection made.

21. Yellow liquor has continued running. No sluffs nor injection.

22. Some pretty laudable yellowish matter came out upon dressing. Injection was made.

23. A little matter issued upon coughing. No injection.

24. The like today.

25. A few small sluffs. Little matter & not yellowish. No injection.

The prominence of the patient together with the unusual malady attracted wide attention at the time. Locke made inquiry among his professional acquaintances for the purpose of obtaining reports of other similar cases. He obtained three replies, one of which described a case of a man who suffered with pain in his right side and stomach for over a year. A great swelling eventually arose at the location of the pain. The tumor was incised by means of a pen knife when, "came out several blathers like winde eggs, some as large as turkey eggs, others like hen eggs." The operative wound was kept open for a year when complete recovery was reported.

Shaftsbury after his operation enjoyed very good health and led an active life though he was always under the necessity of wearing his silver tube. He died in January 1683 from gout which was a comparatively common disease for men of his social standing, though one writer of the time mentions one of the natural causes of his death, the sudden cessation of the discharge from his internal abscess.

The satirists of his day had great fun at Shaftsbury's expense. A vessel with a turn cock constructed for holding alcoholic beverages was nicknamed a *Shaftsbury* and the famous patient in turn was nicknamed *Tapski*. One of the poetasters wrote the following screed referring to Shaftsbury:

> The working ferment of his active mind
> In his weak body's cask with pain confined,
> Would burst the rotten vessel where 'tis bent
> But that 'tis *tapt* to give the treason vent.

And another:

> The silver pipe is no sufficient drain
> For the corruption of this little man.

Few politicians have been more abused than Shaftsbury. Probably no one of his day was more energetic than he and often in the cause of freedom. The very antagonism meted out to him is an indication that he was a foeman worthy of the royalist steel. An English writer, Traill,[1] insists that Shaftsbury occupied an important place in English political history as the first great party leader in the modern sense and as the founder of modern parliamentary oratory. He was the founder of the Whig party of which the English liberal is a lineal descendent.

The following is a characteristic example of the contents of Locke's commonplace books in which he recorded carefully his clinical notes and methods of treatment.

OBSERVATIONES MEDICAE[2]

Contents (1) Hydrops; (2)
Rheumatismus; (3) Hydrops; (4)
Febris Inflammatoria.

The manuscript contains over twenty case reports. The following are some of the more interesting cases. They show how Locke was influenced by the errors of his time but also his endeavour for better methods.

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[1] English Worthies, by H. D. Traill (1886).

[2] From John Locke as Practitioner. By Dr. E. T. Withington. *Janus*, 14: 491, 1909. This is printed with the permission of the Editor of *Janus*.

The first patient was a relative, Peter Locke.

Dry cough Peter Locke aged fourteen years having in the previous winter caught cold through not sufficiently protecting his feet from the damp of the roads, was seized by a violent cough, which with some improvement lasted until April. Complexion florid, habit thin, no fever, appetite fairly good.

April 1st (1668) I prescribed extract of saffron (extractum croci) one grain, gradually increasing to three grains, to be taken with oil of amber—twelve drops—in hyssop water at bed time. Hence the cough diminished some little, and a thick matter was expectorated, but the dry cough returned, and he was purged once mildly with a half a drahm of pill cochia.

May 30th after an absence I prescribed the following; (1) Let him be bled to five or six ounces, (2) take of liquorice half-an-ounce, herbs, scabious and veronica a handfull of each; flowers of roses, bugloss; violets borage, half a handfull of each; figs and dates, five of each; ten jujubes; and an ounce of raisins. Cut them up and pound together. Pour over them a sufficiency of boiling water and stand for 12 hours in a warm place, then boil once or twice in a closed glass or tin vessel. Strain and press out. Let him take a draught of it every morning fasting.

(3) Take of the whitest sugar 4 ounces, liquorice juice a drahm and a half; cooling confection of tragacanth and of pearls each one drahm; red corals powdered to an alcohol, four scruples. Dissolve in hyssop water with a sufficiency of gum tragacanth. Make lozenges the size of a bean. Let him hold one frequently in his mouth.

(4) Take syrup of violets, jujubes, dried roses and poppies equal parts, mix and let him take a teaspoonful every night at bedtime.

Withington makes this comment.

This blunderbus of prescriptions or the summer weather apparently finished the dry cough. The variety of drugs was even greater than appears here, for the cooling confection of pearls (species diamargariton frigida) in prescription (3) contained the four greater "cold seeds" (citrul, cucumber, gourd, melon) seeds of purslane, white poppy, endive and sorrel, citrous, the three kinds of sandal-wood, wood of aloes, ginger, flowers of rose, waterlily, bugloss and violet, myrtle berries and seven other ingredients.

The pill cochia, consisting of an equal quantity of aloes, scammony and colocynth with syrup of wormwood and buckthorn to make a mass, was the stock purgative of the galenical pharmacopaeia. Locke frequently used gamboge 10 to 13 grains. (The modern maximum dose is 4 grains.) It is interesting to note Locke's use of the term alcohol as a fine powder. The term alcohol was originally used to designate a very fine powder of antimony or galena used to paint eyebrows. The name was afterwards applied, owing to the fineness of the powder, to highly rectified spirits. Locke notes in his manuscript diary of 1679 that he received from a friend in France an alcohol or fine powder good to sharpen razors.

In the spring of 1669 Locke had as patient a certain Anne Smithsby, a superior domestic in Shaftsbury house:

Lichen. Anne Smithsby, virgin, aged 30 years and very hysterical, has a serpiginous lichen with pricking pains in the wrist. To this she applies oil extracted from linseed. Afterwards, by my advice, she used, March 5th, decoction of dock leaves and milk, with which she fomented the part twice or thrice daily, and after the fomentation, bound it round with a cloth soaked in the juice of dock roots. Hence it improved, and afterwards was entirely cured by the application of a burgundy pitch plaster.

The following are three cases of measles which occurred in the spring of 1670. The two first were treated by Locke himself, the third of special interest, as the patient was a son of the great Sydenham, and forms a typical instance of the expectant or refrigerant treatment of fevers introduced by him.

Measles (Morbilli). On February 27th I saw a boy aged three years, son of . . . Painter, whose forehead, chin, and especially cheeks were covered with small red spots, barely projecting above the surface, and irregularly scattered. Over the upper part of the chest also the skin was here and there discoloured by the red spots like flea bites. These spots had greatly increased, both in size and number, during the last six hours, and had spread downwards toward the abdomen. But on the legs, thighs and lower part of the body there was no trace of the eruption. From the parents I got the following history:

Feb. 23rd (1st day of disease) he had diarrhoea.

Feb. 24th (2nd day) diarrhoea, running from the eyes and nostrils, cough, continued thirst, loss of appetite, hot and cold fits, somnolence.

Feb. 25th (3rd) the same symptoms.

Feb. 26th (4th) the eruption appeared, without any alteration of the symptoms, but the heat and malaise increased.

Feb. 27th. Besides the spots on the face above mentioned, I found also the former symptoms, namely diarrhoea, cough, thirst, anorexia, somnolence, running at the eyes, swollen eyelids and a high temperature. I prescribed nothing but water of Benedictine thistle (Carduus Benedictus) three ounces, syrup of cloves six drahms. Two spoonfuls to be taken morning and evening. Let him use as ordinary drink pectoral decoction with scabious or hyssop.

The child's little sister, aged eighteen months, suffered from the same disease and showed similar symptoms. It was now the ninth day with her, and the spots had already disappeared from the hands and body, where they had been numerous. The remains of the broken cuticle caused a roughness, especially on the hands, and to a less extent on the chest, where it was perceptible to touch only, as though the spots on those parts had sunk and hidden themselves in the body. On the cheeks the spots appeared to have coalesced into red patches. Forehead and chin, however, were entirely free from them. This infant was worse after the disappearance of the eruption, the temperature rose, a vehement cough seized her at intervals, and she breathed with difficulty. I prescribed the same treatment as for her brother.

The following was the composition of pectoral decoction (Decoctum pectorale) stoned raisins half-an-ounce; prunes, jujubes fifteen of each, six dates, eight figs, an ounce of French barley, half-an-ounce of liquorice, a handful each of maidenhair, hyssop, scabious and coltsfoot. Boil in three pounds of water till only two remain.

Measles. March 7th 1670. W. Sydenham, a boy, aged 11 years, of a delicate constitution, with lungs naturally weak and very liable to cough was taken with shivering and rigor, followed by slightly raised temperature, running at the nose, somnolence, cough, anorexia.

The rigor, shivering and other symptoms increased daily, till the fourth day. The tongue on the fourth day was very white and dry. Bowels natural, but the fever increased, respiration was difficult and more frequent than usual and there was vomiting.

Fifth day. In the evening there appeared on the forehead and cheeks small red spots like flea bites, and all the other symptoms, especially somnolence, increased.

Sixth day. The whole face was discoloured by red spots of irregular shape, composed of very minute red papules, slightly raised above the surface, and causing a roughness of the face perceptible to touch. The whole body was invaded by a number of similar spots, temperature raised, pulse very quick. Cough with excretion of mucous, brought up with difficulty. Severe dyspnoea, eyes sensitive and running, lips swollen, complete anorexia, tongue white and dry, thirst moderate, two motions. Treatment refrigerant, out of bed, drink barley and water.

Seventh day. The spots began to leave the forehead, and by night time only a few pale ones were left on the face. Somnolence and cough diminished, eyes tender, lips dry and swollen, tongue white, moist, breathing easier, fever less, pulse rapid, complete anorexia, three liquid motions, no thirst, no running at the nose. The patient more vivacious, his drink barley water and pectoral decoction; cool regimen, out of bed.

Eighth day. No spots on the face, disappearing from the body. Cough dryer and more frequent. The expectoration which previously accompanied it seemed due not to the present disease, but to the cough he was labouring under before the invasion of the measles, and to which he was liable. Eyes tender, running of eyes and nostrils, some somnolence, tongue white but not dry, breathing more free, pulse quick, one fluid motion, anorexia less, thirst natural. Malaise less than on the fourth and fifth days, when it reached its maximum. The pain in the stomach which troubled him on the previous day was less. Temperature above normal, urine healthy or paler than in health. Drink barley water, and especially decoctum pectorale without scabious or hyssop. Food very light and without meat ( ) out of bed, cooling regimen.

Ninth day. Spots gone from the whole body. Temperature normal. Pulse quick, running from nose and eyes, eyes tender, tongue moist and less white, frequent dry cough. Treatment the same.

Tenth day. Eyes sensitive but no running, no somnolence, breathing difficult, cough troublesome, temperature higher. These symptoms were probably aggravated by his having eaten a little chicken. Tongue white, pulse very quick, bowels natural.

Eleventh day. Eyes less sensitive, breathing not quite free, cough more troublesome, increasing about 4 P.M. and worse at night. Tongue white, pulse very quick, appetite almost none, no thirst. Treatment the same.

Twelfth day. All the same symptoms. Cough increased and even a facies Hippocratica. In the evening he was bled six ounces, whence the cough diminished the same night.

Thirteenth day. Eyes better and nearly normal. Breathing easier, cough relieved, temperature still above normal, pulse quick, tongue much less white, bowels natural, appetite nearly absent, thirst not excessive, face more vivacious. Cough not troublesome even in free and cold air, a little running at the nose returning.

Query. Since these symptoms were not mitigated by bleeding and cold air, it may be asked whether, on the disappearance of the spots, the materia morbi insufficiently evacuated through them, remains latent in the blood, giving rise to fever, cough and all the other symptoms which should be relieved as far as possible by venesection and fresh air?

Query also whether purgation is of use in such cases, for I have seen a case where disappearance of the eruption was followed by diarrhoea, which continued for 14 days, in an infant of 2 years, but without diminishing the fever?

Query—whether the cough is due to slight peripneumonia since it is usually dry, at least without any notable expectoration?

The blood drawn in this case had its red part very fluid, and paler than I have observed elsewhere. The clot also had an irregular and broken surface. Is this usual in such cases, or is it due to some accidental cause?

Fourteenth day. Better in all respects. The cough gradually decreased and disappeared about the 21st day. The patient was kept in the open air, got quite wet, and was purged on April 11th.

Query. Whether those that vomit in the beginning of the measles have during the progress of that disease a diarrhoea or not? Since looseness is sometimes violent enough which accompanies it, or whether it be only in those children which are breeding of teeth?

Query. Whether a dry tongue be not prognostick of the increase of the cough and fever which comes on about the eighth day?

VI

THE PSYCHOLOGIST

Psychology may be said to bear about the same relation to neurology and psychiatry as physiology does to internal medicine. If we accept this assumption the work of John Locke is as important a contribution to the field of the psychiatrist as that of William Harvey is to the internist and surgeon. To Locke is accredited the laying of the foundation of modern psychology. In fact so signal has been his contribution that a modern historian[1] has said that, up to within the past quarter of a century, Locke if he were alive might have held a position in any of the foremost universities in England.

The subject of psychology (we can hardly call it a science at this time) was dealt with somewhat cursorily and incidentally by such philosophical writers as Hobbes,[2] Descartes and Spinoza. But it was left to Locke to study the phenomena of the mind at length. The conclusion of his work was to the effect that all our knowledge is derived from experience. This was reached as the result of a great amount of thoughtful study. Descartes worked on the assumption that there are in the Understanding certain "innate principles" or "innate ideas." This "inborn" knowledge was only implicit and required definite experience to develop it. Descartes compared his so-called "innate ideas" with such diseases as gout or tuberculosis which are said to be "innate" in certain families. Not "because the infants of those families suffer from these diseases in their mother's womb, but because they are born with a certain disposition or tendency to contract them." Had Descartes pursued this thought a little farther he might have been the earliest to enunciate the principles of heredity.

Locke devoted considerable time and space to a refutation of the theory of innate principles, indeed magnified this Cartesian philosophy out of all proportion to its importance. He was in a sense a pioneer, since he was influenced but very little by Francis Bacon or by Thomas Hobbes. While he received his inspiration for philosophical investigation from Descartes, he was in no sense an adherent of the

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[1] "If in the year 1900 Locke had come back to earth, he would have found his authority still as unquestioned as ever, and would without any 'mugging up' have been able to take the chair of psychology at either of our ancient universities." Wingfield-Stratford. The History of British Civilization. Lond., Routledge, 1929. Vol. 2.

[2] Thomas Hobbes (1588–1679) was an English philosopher whose writings coincided in his latter years with those of Locke. Hobbes' great work was the "Leviathan" (1651) which was a comprehensive account of his doctrine on the sovereignty of the State. Hobbes maintained that the State was above everything, even the sovereign, in this age of Divine Right of Kings. He was the one real English thinker of the two generations between Bacon and Locke.

Cartesian philosophy. Locke was the spiritual head of the sensational school which referred the content of the mind to sense-experience, dispensing entirely with the doctrine of innate ideas of Descartes.

Only during the last fourteen years of Locke's life was he known as a philosopher, that is from the publication of his "Essay concerning Human Understanding" (1690) to the end of his days. This does not mean, however, that he was late in attaining his mental maturity. His work began comparatively early, in fact with the encouragement accorded him as already mentioned by his noted patient, the first Earl of Shaftsbury, with whom he lived on intimate terms until Shaftsbury's political downfall in 1675. We may trace the philosophical mind still earlier, when he was a student at Oxford wrestling with the intricate mazes of Aristotelian scholasticism. It may be said to have had its beginning in protest against the hair-splitting subtleties of the schoolmen.

In political and philosophic thought Locke represents a moderate and rational liberalism. He had a wholesome respect for facts and an aversion from abstract speculation which was no doubt accentuated by his experience at the Westminister School and at Oxford. He believed that knowledge must be obtained by rational methods. True, Locke's psychology was introspective, but it was a real honest attempt to look inward. He watched the operations in his own mind and the minds of others, including children and simple minded persons, as a doctor studies the mental reaction of his patients. Locke wrote also on the "Reasonableness of Christianity" in an attempt to found a rational religion based on experience. His religion had at least the merit of adaptation to the varying requirements of intellectual advancement, which cannot be said of much of the sectarianism of the twentieth century.

The circumstances that induced Locke to study the human understanding, which included the whole range of human intelligence, may be given in his own words:

> Were it fit to trouble thee with the history of this Essay, I should tell thee that five or six friends meeting at my chamber, and discoursing on a subject very remote from this, found themselves quickly at a stand by the difficulties that rose on every side. After we had a while puzzled ourselves, without coming any nearer a resolution of those doubts which perplexed us, it came into my thoughts, that we took a wrong course; and that, before we set ourselves upon enquiries of that nature, it was necessary to examine our own abilities, and see what objects our understandings were or were not fitted to deal with. This I proposed to the company, who all readily assented; and thereupon it was agreed, that this should be our first enquiry. Some hasty and undigested thoughts, on a subject I had never before considered, which I set down against our next meeting, gave the first entrance into this discourse, which having been thus begun by chance, was continued by entreaty; written by incoherent parcels; and, after long intervals of neglect, resumed again, as my humor or occasions permitted; and at last, in a retirement, where an attendance on my health gave me leisure, it was brought into that order thou now seest it.

The explanation will appear reasonable, a great many discussions are futile owing to the lack of a common understanding between the disputants. There must be some points conceded in agreement before any discussion can be carried on with any degree of profit.

The writing of the famous Essay occupied the author's time intermittently for about twenty years. It is recalled that Locke's contemporary, Harvey, had completed his great work, "De Motu Cordis," about twelve years before its publication. The reception each work was accorded at the time of publication was much of a kind. Locke forstalled criticism with the statement that he did not pretend to publish his Essay for the information of men of "large thoughts and quick apprehensions"; to such masters of knowledge he professed himself a scholar (a student) and therefore warned them beforehand not to expect anything but what, being spun out of his own coarse thoughts, was fitted to men of his own size. The work in fact was not intended for public consumption but only for the few more or less intimate associates who had prompted it. Such is Locke's statement.

The "Essay on Human Understanding"[1] is very long and contains many repetitions. The author realized this fault himself. "I will not deny," said he, "but possibly it might be reduced to a narrower compass than it is, but to confess the truth I am now too lazy or too busy to make it shorter."

The work is divided into four sections or books. The substance of the first of the four is a refutation of the Cartesian contention that ideas are innate. What Locke really objected to was the claim that our assumed knowledge, including our fundamental principles of morality, should be considered immune to free and honest criticism. In attacking the doctrine of innate principles he argued for the application of reason as opposed to explicit reliance upon authority.

In book II the author maintains that all human ideas, even those concerned with the abstract and the sublime, depend in the last analysis upon experience, that is, either from five senses or from reflection based on sensations. Our thoughts of space, time, power, substance, infinity depend either upon the perception of things external or through the operations of the mind within. He regards reflection as a sort of internal sense. This book contains an account of the "origin of our ideas" and the way in which the mind comes to be "furnished with simple ideas of sensation and reflection which it subsequently manipulates so as to form complex ideas of modes, substance and relations." Ideas are not in themselves knowledge but only the materials of thinking. It also sets forth Locke's *thesis of experience* as the source of all our knowledge. According to Pringle-Pattison: "By the famous opening sections of the Second Book Locke has written himself down as the founder of the English philosophy of experience."

The third book deals with language. In his work the author avoids the technical jargon of the schools and writes in the language of the best current literature and that used by the most cultured people of his time. Since language is in a sense the "flesh garment of thought," Locke devotes the entire section of his Essay to a

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[1] There are several abridged editions of the "Essay concerning Human Understanding." That used largely in the preparation of this Chapter is by A. S. Pringle-Pattison, published by the Oxford University Press, 1924. It is recommended to anyone wishing a convenient and well-edited volume of Locke's great work.

> discussion of words or language in general.
>
> Man therefore had by nature his organs so fashioned as to be fit to frame articulate sounds which we call words. But this was not enough to produce language. It was further necessary that he should be able to use these sounds as signs of internal conceptions, and to make them stand as marks for the ideas within his own mind, whereby they might be made known to others.

He discusses the various inadequacies of language as a medium for exact thinking and proceeds to suggest how linguistic difficulties may be overcome.

The fourth book of the Essay is entitled "Of Knowledge and Opinion." In it the author considers knowledge as perception of relations among ideas. It treats not only of the nature of Knowledge, its degrees, extent and reality, but of Truth and certainty of universal propositions; of our knowledge of existence; of our knowledge of the existence of God and of our knowledge of the existence of other things. The author discusses also such subjects as Judgment, Probability, Reason, and Reason and Faith and their distinct provinces, Enthusiasm, Error, and finally the Division of the Sciences. It is beyond the scope of this work to elaborate on this famous Essay. The reader interested in a detailed study of Locke's "Essay concerning Human Understanding" would do well to procure an abridgment of the work such as that mentioned. (See footnote, p. 47.)

There was no other period in English history so unsettled and less conducive to the sequestered existence so necessary to the thinker. So dangerous were the times that Locke was forced to go into exile to Holland with his patron Shaftsbury.

> To Locke, "ideas"[1] were the objects of thinking or, as a more recent writer terms them, items of knowledge.
>
> If we can divide what we know consciously at any given time into components, we have *ideas*. It is this meaning of *ideas* that we have in the phrase *association of ideas*. The Lockian conception approximates present day common sense; the man of the street believes that his head is full of ideas and that these ideas are what one thinks about.[2]

This notion has persisted in some respects until our own times. By the term *associate* and *association* he had in mind combination of ideas. A successor, David Hartley[3] (1705–1757), who was also a physician as well as a student of the mind, went further and established "association of ideas" as a doctrine in psychology. Hartley was the founder rather than the originator of "associationism."

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[1] "The theory of ideas," to quote MacDougall, "has had a most varied and influential career in both philosophy and psychology, an influence that lives on though no one has been able to make of it a consistent and intelligible theory. In Plato's theory of ideas each 'idea' was a supernatural archetype of a class of things; and the 'ideas' existed in some remote and inaccessible region."

MacDougall, William. Outline of Psychology. N. Y., Scribner, 1923.

[2] Boring, E. G. History of Experimental Psychology. N. Y., Century, 1929, Chap. ix.

[3] It is interesting to recall the number of first-class contributors to psychology who have been educated for medicine. Subsequent to Locke himself we have such men as Hartley who has been described as a "kindly physician of scholarly habits who dispensed his philosophy for mental ills along with his other drugs." Others might be mentioned who studied medicine for the purpose of earning a living and eventually drifted to psychology, including Lotze (1817–1881), Helmholtz (1821–1894), Wundt (1834–1920) and in America one of the greatest, William James, and William MacDougall, both professors in Harvard University. Hartley and Locke studied theology but being unable to enter the church owing to their heterodox views, both entered the medical profession.

Parenthetically might be given Locke's conception of the *Association of Ideas* which was later elaborated by Hartley:

> Many children imputing the pain they endured at school to their books they were corrected for, so join those ideas together, that a book becomes their aversion, and they are never reconciled to the study and use of them all their lives after; and thus reading becomes a torment to them, which otherwise possibly they might have made the great pleasure of their lives. There are rooms convenient enough, that some men cannot study in, and fashions of vessels, which though ever so clean and commodious, they cannot drink out of, and that by reason of some accidental ideas which are annexed to them and make them offensive. And who is there that hath not observed some man to flag at the appearance or in the company of some certain person not otherwise superior to him, but because, having once on some occasion got the ascendant, the idea of authority and distance goes along with that of the person, and he that has been thus subjected is not able to separate them.[1]

Said Locke:

> Let us suppose the mind to be white paper void of all characters without any ideas. How comes it to be furnished? Whence comes it by that vast store which the busy and boundless fancy of man has painted on it with an almost endless variety? Whence has it all the materials of reason and knowledge? To this I answer in one word from *experience*. In that all our knowledge is founded, and from that it ultimately derives itself.

Ideas are derived from two sources *sensation* and *reflection*. The qualities of objects such as shape, color, size are conveyed to the mind through the medium of the special senses. The second source is Locke's explanation as to how the mind is aware of its own operations.

Then he proceeds:

> Our observation employed either about external or sensible objects, or about the internal operations of our minds perceived and reflected on by ourselves, is that which supplies our Understandings with all the materials of thinking. These two are the Fountains of Knowledge from which all the ideas we have, or can naturally have, do spring.
>
> First, our Senses, conversant about particular sensible objects, do convey into the mind several distinct perceptions of things, according to those various ways in which those objects do affect them. And thus we come by those ideas we have of Yellow, White, Cold, Soft, Hard, Bitter, Sweet, and all those which we call Sensible Qualities, which when I say the senses convey into the mind, I mean they from external objects convey into the mind what produces there those perceptions. This great source of most of the Ideas we have, depending wholly upon our senses, and derived by them to the Understanding, I call Sensation.
>
> Secondly, the other Fountain, from which Experience furnished the Understanding with Ideas, is the Perception of the operations of our own minds within us, as it is employed about the ideas it has got; which operations, when the soul comes to reflect on and consider, do furnish the Understanding with another set of ideas which could not be had from things without; and such are Perception. Thinking, Doubting, Believing, Reasoning, Knowing, Willing, and all the different actings of our own minds, which we being conscious of, and observing ourselves, do from these receive into our Understanding as distinct

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[1] Quoted by Thomas Fowler in article on Locke in English Men of Letters. N. Y., Macmillan, 1878.

ideas as we do from bodies affecting our senses. This source of ideas every man has wholly in himself. And though it be not sense, as having nothing to do with external objects, yet it is very like it, and might properly enough be called Internal Sense. But as I call the other Sensation, so I call this Reflection, the ideas it affords being such only as the mind gets by reflecting on its own operations within itself.

By Reflection, then, in the following part of this Discourse, I would be understood to mean that notice which the mind takes of its own operations and the manner of them, by reason whereof there come to be Ideas of these operations in the Understanding. These two, I say, namely, external material things, as the objects of Sensation, and the operations of our own minds within, as the objects of Reflection, are to me the only originals from whence all our ideas take their beginning. The term operations here I use in a large sense, as comprehending not barely the actions of the mind about its ideas, but some sort of passions arising sometimes from them, such as is the satisfaction or uneasiness arising from any thought.

The Understanding seems to me not to have the least glimmering of any ideas which it doth not receive from one of these two. External objects furnish the mind with the ideas of sensible qualities, which are all those different perceptions they produce in us; and the mind furnishes the Understanding with ideas of its own operations.[1]

Sensation was, then, according to Locke the basis of experience and experience the basis of thought. Every person began life with a clean sheet. As the rhyme goes:

Life is a sheet of paper white
Whereon we write our word or two
And then comes night.

Everything depended upon environment, upon nurture. Locke's theory of the mind failed to take into consideration the subject of heredity. The mind of the newborn infant is not by any means a blank. The individual comes into the world with an elaborate set of instincts which almost inexorably determine the course of his life. He enters life already shackled or with possibilities for greatness. A good heredity is of the greatest importance. Some students of heredity such as Sir Francis Galton and Gobineau maintain that man's natural abilities are derived by inheritance. In other words the sires live in the sons. We cannot gather figs of thistles or, as it is expressed more homely, one cannot make a silk purse out of a sow's ear. According to this school of thought it is impossible to produce great men by any process of education.

Then there are others such as Raymond Pearl, H. S. Jennings and Thomas Hunt Morgan who feel that actual results do not justify the claims of the eugenists. Heredity and its laws, as one writer[2] puts it, are filled with imponderable mysteries. To predict with any degree of accuracy the character of offspring from any particular parentage would demand greater knowledge than we possess at present. Raymond Pearl has made a study of men of eminence, their fathers and their sons. Of sixty-three philosophers whose biographies are in the Encyclopedia Britannica, the fathers of only two were of sufficient eminence for public record and of the sixty-three philosophers only five produced children that were more than ordinarily gifted or distinguished. And of eighty-five great poets studied only three had fathers who had achieved distinction. It may urged, however, that genius is a law unto itself and therefore cannot be accounted for by any known laws of heredity.

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[1] Essay on Human Understanding, Book II, Chapter I.

[2] Odegard, Peter. The American Public Mind. Columbia Univ. Press, 1930.

Locke would seem to have his twentieth century counterpart in the *behaviorist.* To quote John Watson, the great exponent of behaviorist psychology:

> The behaviorist finds that the human being at birth is a very lowly piece of unformed protoplasm ready to be shaped by any family in whose care it is first placed. This piece of protoplasm breathes, makes babbling, gurgling, cooing sounds with its vocal mechanisms, slaps its arms and legs about . . . cries, excretes through the skin and other organs waste matter from its food . . . In short, it squirms (responds) when environment (inside or out) attacks it (stimulates it). This is the solid observational rock upon which the behaviorist's view is founded.[1]

As might be inferred from Locke's "mind" as a *tabula rasa,* man begins life as a physiochemical organism without any psychological hindrance or advantage in the matter of heritage. Such appears to be the theory of the modern behaviorist. Both employed to a large extent objective methods of study. Locke, considering he was a pioneer among students of psychology, was so far advanced that his work in many respects would fit into the literature of the subject of the present generation.

VII

THE POLITICAL PHILOSOPHER

Perhaps at no other time in English history had there been so much philosophizing on theories of state and government as during the seventeenth century. This was due to the troublous times which as we have seen lead up to the civil war and the Revolution of 1688 and after when the rights of kings and subjects, the origin and function of governments, the justification of rebellion and similar subjects were more or less freely discussed. These topics were discussed from pulpits, in the law courts, in parliament and on the streets. The influence of the English political philosophers particularly that of Locke had extended beyond the confines of the nation; in France, forming the seeds of the French revolution and in America resulting in an actual separation from the mother country. The first work of the kind was "The Leviathan" by Thomas Hobbes, who put forth his theory of state to the effect that governments should be all powerful.

Hobbes wrote his "Leviathan" between 1641 and 1651 while he was an exile in Paris. He was a Royalist who found the home atmosphere most uncongenial during the accession of Cromwell. Men who write in exile, while they gain in concentration of purpose, are apt to lose from the lack of daily contact with other men's minds, particularly those of their own country. "The Leviathan" was an incentive for the Stuarts after the Restoration of 1660 to attempt to found a personal monarchy based on force. Hobbes believed in the wholesome discipline of fear in governments. "Men have no pleasure, but on the contrary a great deal of grief in keeping company where there is no power able to over-awe them all." And again, "No man obeys them whom they think have no power to help or hurt them." As a result we have the Revolution of 1688. From this time on there has been a reasoned opposition to kingly power which has been developed by John Locke and by Montesquieu.

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[1] Quoted by Odegard, P. The American Public Mind, Columbia Univ. Press, 1930.

The first two or three decades of the seventeenth century were in all essentials Elizabethan. The doctrine of Divine Right of Kings, however, had its strongest advocate in James I, who died two or three years before Locke was born. This dogma persisted through the reign of Charles I and despite Cromwell's rule seemed to have maintained its foothold following the restoration (1660). The political doctrine advocated in "The Leviathan" appeared to give it strength. Locke, however, held quite a different view. He maintained that sovereignty rested upon contract with the nation, the will of the governed, and that the chief element in contract was consent. Locke's treatises on civil government were published in 1690, two years after the bloodless revolution which placed William and Mary on the throne of England. The effect was almost immediate and lasting. The right of the King of Great Britain forever after must rest on the consent of the people as expressed through parliament.

Locke's theory of contract took root in France where it inspired Rousseau to write his "Social Contract" which carried the doctrine farther than he could ever have anticipated. Locke, the apostle of English liberalism, did more to promote intellectual freedom, whether in political or theological thinking, than any other man of his time or since. His influence was felt particularly in America where his treatise on civil government had become virtually a textbook of the colonies before the revolution. His writings made a stronger appeal to the colonists than those of any other political philosopher. They set forth the right of citizens to overthrow governments that took their property without their consent. Locke's influence was greater than that of any one man in preparing the minds of the colonists for the revolution. In a sermon preached before the local assembly of Massachusetts, May 31, 1775, the President of Harvard College declared that, "When one form of government is found by the majority not to answer the grand purpose in any tolerable degree, they may by common consent put an end to it and set up another." In the highways and byways, says Beard, this familiar sentiment gathered from the writings of John Locke gradually become the chief topic of conversation and debate. It was only a step from thought to action which was precipitated in 1776 in the revolt of the colonists. With Locke the object of government was to protect property and when government forgets or ceases to perform this function the people have the right to change or to abolish the government and to set up a new one. "The state of nature," writes Locke, "has a law of nature to govern it which obliges everyone, and reason which is that law, teaches all mankind who will but consult it, that being all equal and independent, no one ought to harm another in his life, 'health, liberty or possessions.'"

Of the two treatises on civil government the first may be dismissed with a statement of the fact that it is of a controversial nature with the work of a certain Sir Robert Filmer, a Tory apologist, who endeavored to prove that Charles I derived his title to the Crown of England from Adam. Filmer was a strong proponent of the theory of Divine Right and had many followers at the time but his name would never have survived the century had not Locke rescued him from oblivion by noticing him in the first treatise, for today Thomas Hobbes' "Leviathan" is considered the most powerful exponent of absolutism.

Locke must be judged then by his second treatise, "An Essay Concerning the True Original Extent and End of Civil Government." Regarding his second treatise of government, Sir Frederick Pollock has declared it to be probably the most important contribution ever made to English constitutional law by an author who was not a lawyer by profession. According to Locke, political power exists and should be exercised only for the public good. The basis of government is consent. Princes and rulers exercise power as a trust not as any absolute right conferred upon them. Locke's purpose in writing the two treatises was to justify the revolution of 1688, as well as to confute the doctrine of a monarchy founded on the political dogma of divine right. He taught the idea of democracy in which government rested on consent and upon the good will of the governed.

> The whole trust, power and authority of the magistrate is vested in him for no other purpose but to be made use of for the good, preservation and peace of man in that society over which he is set, and therefore that this alone is and ought to be the standard measure according to which he ought to square and proportion his laws, model and frame his government. For, if men could live peacefully and quietly together, without uniting under certain laws, and growing into a commonwealth, there would be no need at all of magistrates or politics, which were only made to preserve men in this world from the fraud and violence of one another.[1]

In his second treatise Locke discusses the state of nature to which commonwealths owe their existence. It is, however, a social state in which men recognize the rule of reason which teaches that no one should harm another so far as his life, liberty or property are concerned. War results only when men have abandoned the rule of reason. Locke postulates the right of private property, which right is extended to things which man has changed from their natural state by his own labor.

Regarding legislative power he maintains that it becomes the supreme power of the state only with the consent of the people for whose good it must be exercised. It is not arbitrary. No man can be deprived of his property without his consent and taxes cannot be levied without the consent of the people or their representatives. The legislature is but a delegated power from the people who alone can dissolve it.[2]

It is too much to expect one of the earliest works on government to be faultless. Locke lived at a time when the scientific method was very elementary. It was easier to theorize than to observe social phenomena and to formulate conclusions based on careful observation. In the primitive stages of human development, says Fowler,[3] governments, like languages, are not made; they grow. In the seventeenth century exploration and observation among primitive people was not thought of. It was much easier to sit in an armchair and to philosophize. Today the so-called "state of nature" of Locke is a mere fiction. Locke's chief fault then was one common to his age; it consisted in assuming that primitive man was actuated by the same motives and proceeded by the same deliberation as the men of his own time. He was what may be called a speculative rather than scientific philosopher.

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[1] Fox Bourne, H. R. Life of John Locke. N. Y., Harper, 1878.

[2] W. S. Carpenter in Everyman's Library Series.

[3] Fowler, Thomas. John Locke. English Men of Letters Series. N. Y. Macmillan, 1878.

According to Locke's political theory sovereignty exists nowhere except in the community as a whole. Democracy is rather a spirit than a form of government. The rulers, no matter what form the government takes, are the trustees of the people who delegate the power to them.

After the civil war and the restoration of Charles II there were courtiers and political parasites to be rewarded. Among the number were eight whose claim to recognition seemed stronger than the others though the names are unimportant so far as their subsequent influence upon history is concerned. Charles bestowed upon them a great tract of land in America which stretched from the Atlantic to the Pacific—Carolina, from a Latinized version of his own name. This these supporters were to rule jointly subject only to the laws of England and the will of a local assembly. Some years following the confirmation of the grant by charter Locke was engaged to draft a constitution for Carolina. Locke's constitution proposed that the oldest proprietor should be palatine, and that others should be admiral, chamberlain, constable chief justice, high steward and treasurer, according to lot. One-fifth of the land was to be the personal property of the proprietors; an aristocracy was to possess another large portion which was to be laid out in baronies and manors. The remainder was to be sold to freeholders. The system of government designed by Locke provided for a popular assembly which was to act as a check on the aristocracy. It goes without saying that such a constitution was utterly impractical for frontier life in America in the seventeenth century. Fantastic as this may seem, however, it shows the type of society which the Whigs, who were the most liberal of the governing classes in England, would have established in America had they not been thwarted by the exigencies of pioneer life in this country. Before condemning Locke too severely it should be remembered that this was nearly a century before the American Revolution of which Locke, all unknowingly, was to be the instigator and inspiration.

Locke's "Letter Concerning Toleration" may be conveniently considered in connection with his theory of state. It appeared in the year 1689 the year of the Act of Toleration which granted religious freedom to all except Unitarians and Catholics. This was an inconsistent and absurd piece of legislation, a mixture of toleration and intolerance but perhaps as good as could be expected from the sort of public opinion that prevailed at the time.

The main argument of the letter on toleration is based on the principle that the function of civil government is quite different from that of religion. The duty of the state is to promote and preserve such civil interests of its members as life, liberty, health and property rights. The care of souls was not any part of the function of magistrates who could use only outward force. True religion was a matter which concerned the mind and the human mind was so constituted that force could not compel belief. It was absurd for the state to attempt to make laws to enforce religious belief as laws were ineffective without penalties and penalties did not convince. Locke would grant full liberty to idolaters, by whom he meant particularly the American Indians. He condemned the religious zeal which compelled these "innocent pagans" to forsake their ancient religion. He was himself inclined strongly to Unitarianism and if he was in any way intolerant himself it was towards those who, were they in power, would deny complete religious freedom to others. The other exception with him was the atheist whose freedom he would curtail on the grounds that promises, convenants and oaths which are the bounds of human society could have no hold upon an atheist. Locke was a deist and claimed that disbelief in God "though but even in thought dissolved all." He was not entirely free from the prejudices of his time though much in advance of multitudes even of the twentieth century. In spite of the limitations of the "Letter Concerning Toleration" it was a work of the greatest value, asserting as it did the secular principle which at present prevails in most English-speaking countries except England herself with its established church.

VIII

AN EXILE TO HOLLAND

Locke went into voluntary exile to Holland when he was fifty-two years old. In 1683 England was an unsafe place for the advocate of liberalism. Charles II was on the throne. The King who Locke welcomed at the time of the restoration had proved a bitter disappointment to the liberty-loving Englishman. Locke's friend Shaftsbury, for whom he did so much, avoided execution by escaping to Amsterdam. Several of Locke's intimate friends in England had been beheaded and others were imprisoned in the Tower of London. Justice had during this time abandoned the English courts. The notorious Judge Jeffreys represented the travesty that still prevailed. Locke sought refuge not far from home. The Northern Netherlands was the safest and freest place in Europe as a refuge for free-thinking persons. The Netherlands possessed an honest zeal for political and religious liberty. Holland was a political asylum for both Locke and his former patron.

He went to Amsterdam in 1683 when we have an account of an invitation from the chief physician there to be present at the dissection of a lioness which had met its death owing to the severity of the winter. His interest in dissection and in medical matters was maintained throughout his life.

He appears to have looked upon his voluntary exile in the Netherlands as somewhat of a holiday. As usual he made copious notes of his sojourn which describe the inhabitants of the various towns of Holland including its institutions of learning, which even during the seventeenth century appeared to be far advanced beyond those of most other countries. "A thing worthy of imitation in other places," said Locke commenting upon the Universities, "is that anyone may take his degree here when he is fit—abilities and not time, being only looked after."

Six days after his arrival he proceeded to Leyden where Descartes, whose work was his first incentive to original and independent thinking, spent eight years in seclusion, working out his famous Discourse on Method of Philosophy. To Leyden Spinoza had fled from the persecution of his kinsfolk in Amsterdam. Among the intellectual refugees might be mentioned also Armenius who taught a non-sectarian Christianity. Locke took advantage of the opportunities offered by the famous medical school for further medical study.

Much time was spent in Utrecht and at Amsterdam where he formed valuable friendships. During his exile in Holland he was busily engaged chiefly in the preparation of his "Essay concerning the Human Understanding" as well as other works that were in a few years to be published. Holland was an ideal place of habitation for the literary worker of radical views. The censorship of the press was so strict during the seventeenth century that many writers sought refuge in the northern Netherlands which granted greater liberty to writers than elsewhere. Eventually, "except in times of excitement, so lax was the supervision of the press that Amsterdam and Leyden became the great publishing centers of all the liberal writers of every country. Scientists smitten with the censure of the Index, heretics of the extreme left, daring philosophers and political exiles, all found in the Netherlands publishers for works unprintable at home. Galilei's 'Dialogue on the New Sciences,' the 'Tracts' of Socinus, the 'Treatises' of Descartes, Locke's 'Letter on Tolerance' are only a few examples of the many famous works printed in the Netherlands."[1]

The death of Charles II in 1685 and the peaceful accession of his brother made the situation at home even more grave than before so far as Locke was concerned. He was regarded as a dangerous political foe and traitor by James II's government. He was named last in a list of "Eighty-four dangerous Englishmen, plotters against the life of King James and the peace of the English nation." Locke's name was not in the original list, but appears to have been added by the English Consul in Holland who was a personal enemy of the physician-philosopher. His Dutch friends, however, proved true and placed before him every manner of protection. Locke's friends in London were no less active in his behalf. Among them must be mentioned William Penn, whom he had known at Oxford. Penn interceded directly with King James II himself who promised to be lenient with Locke whose name was finally omitted from the list of alleged traitors to the peace of England. He remained in Holland, however, until 1688, the date of the Revolution when James II was deposed and the crown of England offered to William of Orange and his wife Mary (James II's daughter). During the latter period of Locke's exile in Holland he developed a genuine friendship with William and Mary, who were soon to be the ruling monarchs of his native land. The new King left for England on November 1, 1688. Locke did not return home, however, until three months later, when he crossed the Channel with Queen Mary, after an exile of five and one-half years spent in Holland, which time appears to have been spent very profitably not only in literary production, but in the formation of friends with whom he corresponded throughout his remaining years.

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[1] Smith, Preserved A History of Modern Culture. N. Y., Holt.

IX

THE LAST YEARS[1]

While, as has been already mentioned, Locke never married, he adopted, *in loco parentis*, a boy, Peter King, a son of a first cousin. The youth was evidently a "lad o' pairts," in as much as Locke derived great satisfaction in superintending his education. During his sojourn in Holland, he sent for his ward and put him in Leyden University to complete his formal education. The young student desired at first to become a clergyman, but, we are told, conscientious scruples about entering the established church disposed him to change his mind, with the result that he became a student of the Middle Temple and devoted his time to law. Locke made frequent visits to London, after he had virtually retired to Oates, to make a companion of the young man. After he had finished the course in Law his mentor wrote him: "I am glad you are so well entered at the bar. It is my advice to you to go on so, gently by degrees, and to speak only on things you are perfectly master of, till you have got a confidence of habit of talking at the bar. I have many reasons for it, which I shall discover to you when I see you." Good advice.

Sometime in November 1696, Locke and the King (William III) went incognito to a meeting of the Society of Friends. Both expressed themselves as highly pleased with the services. Throughout his life Locke was deeply religious but his religion was not of a sectarian character. In fact he was considered by a great many as having strong leanings towards Unitarianism. He sought to act according to the dictates of reason in theology as he did in his elaborate endeavor to investigate the human understanding. The theology which prevailed during the seventeenth century at times excited his aversion, and lead him to doubt the wisdom of his fellowmen. "There is reason to believe," he wrote, "that beasts are wiser than men for as one of our burlesque poets has said:

> For beasts with beasts
> Fight not for the worship of us men,
> Though we have done as much for them.
> The Egyptians worshipped dogs, and for
> Their faith made zealous war;
> Others adored a rat and some
> For that Church suffered martyrdom;
> The Indians fought for truth
> Of th' elephant and monkey's tooth;
> But no beast ever was so slight
> For man, as for his god, to fight;
> They have more wit alas! and know
> Themselves and us better than so.

The extract is from Samuel Butler's "Hudibras." Butler, described as "bitter, scornful and full of bold common sense," was the great satirist of his day. He died when Locke was forty-eight years old.

Compare this thought with that expressed by Walt Whitman in the nineteenth century:

> I think I could turn and live with animals,
> They're so placid and self-contained,
> I stand and look at them long and long,
> They do not sweat and whine about their condition,
> They do not lie awake in the dark and weep for their sins,
> They do not make me sick discussing their duty to God,
> Not one is dissatisfied, not one is demented with the mania of owning things,
> Not one kneels to another, nor to his kind that lived thousands of years ago,
> Not one is respectable or unhappy over the whole earth.

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[1] Some of the quotations as well as much of the material pertaining to the personal aspects of Locke's life are for the most part from Fox Bourne's Life of John Locke which is the most complete storehouse of information on the subject.

During his later years, Locke held a position as member of the council of trade. He over-worked during the summer and fall of 1697. To a friend he wrote:

> I have had less health and more business since I writ you last than ever I had for so long together in my life. Business kept me in town longer than it was convenient for my health. All the day from my rising was commonly spent at that, and, when I came home at night, my shortness of breath and panting for want of it, made me ordinarily so weary that I had no heart to do anything; so that the usual diversion of my vacant hours forsook me and reading was a burden to me.

After retiring to his village home, when quiet he felt relieved, but on exertion he complained of being, "immediately out of breath." Continuing, to the same friend, he writes: "I wish you were here with me for you would find that, sitting by my fireside, I could bear my part in discoursing, laughing and being merry with you as well as ever I could in my life." And finally he says: "Do not, therefore, figure to yourself that I am languishing away my last hours under an unsocial despondency and the weight of my infirmity. True I do not count upon years of life to come, but, I thank God, I have not many uneasy hours here in the four and twenty."

Locke refused to give up but persisted in the endeavor to live in a sort of happy retirement and in the desire to meet death as a friend whenever it should come.

For three or four years, between periods of prostration, he made frequent visits from Oates to London in the performance of his duties as commissioner of trade, but in June, 1700 resigned the position, after which act the last four years of his life were spent in complete retirement so far as any public duties were concerned. This period of leisure was spent in writing to his friends, who, judging from his correspondence were wholly worthy of his friendship.

Besides his great capacity for making and enjoying loyal friendships, perhaps there was never combined in one man to such a happy degree, the metaphysician and man of affairs. Nearly all his works were designed for the purpose of advancing the political, social and religious condition, first of his contemporaries and second of the larger world. In his work on government he was in a sense the father of political science. In his "Essay concerning Toleration" he laid anew the foundation for a renewed interpretation of the spirit of the brotherhood of man which he taught "In the Reasonableness of Christianity." In his "Some Thoughts concerning Education" and "The Conduct of the Understanding," he presented ethical hints of the highest importance. For over thirteen years he was active in politics, wielding a statesmanlike influence in the service of his country.

Lady Masham, at whose home he lived, said of him:

> No man was less magisterial or dogmatic than he, or less offended with any man dissenting from him in opinion. He was alike conversible with all sorts of people, and equally pleased and profited all; which proceeded not purely from his singular humanity and good breeding, that taught him to accommodate himself to everyone, but also from his real persuasion that he could learn something which was useful of everybody, together with a universal love of all sorts of useful knowledge; from whence, and from his

custom of suiting his discourse to the understanding and proper skill of everyone he conversed with, he had acquired so much insight into all manner of arts and trades as was to everybody surprising.

Pierre Coste another contemporary confirms this account. "Nobody," said he, "was ever a greater master of the art of accommodating himself to all capacities. It was his peculiar art of conversation to lead people to talk of what they understood best. With a gardener he discoursed of gardening; with a jeweller, of diamonds; with a chemist, of drugs and so on." Locke was accustomed to say that by this he managed to please all those men who generally could not speak intelligently about anything else. "When they see that I know something about their business," said he, "they are pleased to tell me more about it and thus I profit by conversing with them."

His charity went out apparently to everybody, though he was more bountiful to those indigents who attended church than to those who spent their time lazily at home on Sundays, or worse still frequented the ale house. He couldn't bear to see anything wasted. He could not see anything destroyed that might serve as nourishment to any creature, even the birds of the air; he was a great advocate, not only of economy, but also of order. He had a strong disposition to fits of temper, which good sense and good breeding finally overcame to such a degree that many were never aware of this Lockean trait. He saw early the folly of exhibiting temper towards children or servants and recognized the fact that the man who lost or failed to control his temper was at a serious disadvantage in the presence of his adversary.

Locke never violated a confidence nor dealt in gossip that would be detrimental to anyone. A contemporary says, "He was very exact to his word, and religiously performed everything that he promised."

In personal appearance and habits he was very neat without affectation; he was very alert and active; fond of walking, with his garden as a hobby during the summers. His physical alertness was held in check by his recrudescent pulmonary condition. The weakness of his health we are told gave trouble to none but himself, except their distress at seeing him suffer. Naturally such a valetudinarian could have attained his ripe age only by being a total abstainer from alcoholic beverages.

Locke's vision was unimpaired to the end of his life so that he could read, by candle light, books even with small print.

During the winter of 1703 he suffered more severely than usual. To Peter King, his ward, he wrote:

> As to my lungs they go on their course, and, though they have brought me now to be good for nothing, I am not surprised at it. They have lasted longer already than the world or I had expected. How much longer they will be able to blow at the hard rate they do, I cannot precisely say; but in the race of human life, when breath is wanting for the least motion, one cannot be far from one's journey's end.

But the end of the journey did not come until the following year, when we are told, "The footsteps of death were within hearing and he listened for them and waited for them, without a sigh, without a fear. The only meaning of their sound to him was that he must lose no time in putting everything in order before it was too late." He made his will and was able to make very substantial bequests to his friends and servants.

The end came peacefully on October 28, 1704 after which he was buried as he had requested in a plain wooden coffin, without cloth or velvet, on the sunny side of the parish church where his grave is still visited by some occasional pilgrim. On his tomb may be seen the inscription composed by himself.

Siste Viator[1]

Hic juxta situs est Johannes Locke. Si qualis fuerit rogas, mediocritate sua contentum se vixisse respondet. Literis innutritus eousque tantum profecit, ut veritati unice litaret. Hoc ex scriptis illius disce; quae quod de eo reliquum est majori fide tibi exhibebunt quam epitaphii suspecta elogia. Virtutes si quas habuit, minores sane quam quas sibi laudi tibi in exemplum proponeret. Vitia una sepeliantur. Morum exemplum si quaeras in Evangelio habes: vitiorum utinam nunquam: mortalitatis certe (quod prosit) hic et ubique.

Natum Anno Dom. 1632 Aug. 29. Mortuum Anno Dom. 1704 Oct. 28. Memorat haec tabula brevit et ipse interitura.

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[1] Stay, traveller: near this place lies John Locke. If you ask what sort of man he was the answer is that he was contented with his modest lot. Bred a scholar, he used his studies to devote himself to truth alone. This you may learn from his writings; which will show you anything else that is to be said about him more faithfully than the doubtful eulogies of an epitaph. His virtues, if he had any, were too slight for him to offer them to his own credit, or as an example to you. Let his vices be buried with him. Of good life, you have an example, should you desire it, in the gospel; of vice, would there were none for you; of mortality, surely (and may you profit by it) you have one here and everywhere.

That he was born on the 29th of August in the year of our Lord 1632, and that he died on the 28th of October in the year of our Lord 1704, this tablet, which itself will quickly perish, is a record."

(To Be Concluded)

WILLIAM ANDRE, ANATOMIST

By GEORGE C. PEACHEY

LONDON, ENG.

IN my "Memoir of William and John Hunter" published in 1924, in enumerating John Hunter's assistants in his Museum, I mentioned that on William Lynn's departure in 1784, after serving in that capacity for twelve years, he was succeeded by Mr. Andre. The identity of this anatomist I regarded as uncertain, but since I could find evidence of only one surgeon of that name I thought him to be John Andree, the son of the physician of those names who was one of the founders of, and for many years physician to, the London Hospital. Further search has been rewarded and I can now definitely state that my identification of John Andree as John Hunter's assistant was mistaken.

In preparing a biographical memoir of John Heaviside, F.R.S., Surgeon Extraordinary to George III, which is now in the press, I examined a list of specimens purchased by William Clift on behalf of the College of Surgeons at the sale of Heaviside's Museum in 1829. A note in Clift's writing speaks of a specimen as having been prepared

> . . . by Mr. William Andre, surgeon, who was Mr. Hunter's assistant in the Museum for some years. He was an excellent anatomist and so passionately fond of the subject that he could not attend to his profession. He afterwards became house-surgeon to the Earl of Egremont at Petworth, at Mr. Hunter's recommendation. He was the author of a paper on the "Teeth of Fishes" which was printed in the *Philosophical Transactions* in 1784. He prepared most of the specimens in Heaviside's collection as Mr. Heaviside himself informed me, but whether for him or for Mr. Henry Watson, surgeon to the Westminster Hospital, at whose death Mr. Heaviside became the purchaser of his collection, Mr. Heaviside did not mention.

A note by Sir Anthony Carlisle says that they were unquestionably first in Mr. Watson's possession.

William Andre's parentage and early career are not recorded. His name is neither in the College lists, nor in the Medical Register of 1783, but we know that, though he possessed no diploma, he was practicing as a surgeon at least as early as 1773, when he was living in Mortimer Street, Cavendish Square. In November of that year, he addressed a paper to Henry Watson, F.R.S., to whom it is probable that Andre had been apprenticed while Watson had been surgeon to the Middlesex Hospital, between 1751 and 1762, in which year he resigned that appointment for a similar office at the Westminster Hospital. This paper was received on the 3rd and read before the Royal Society on November 25, 1773. It describes a case of aneurysm of the descending aorta to which Andre had been called by a Mr. Saunders, the patient's apothecary. The patient died eight hours afterwards and a post-mortem examination was performed by Andre, who dissected out the aneurysm. This paper was not printed in the *Transactions*. Andre, however, was the author of two others which were so published in 1782 and 1784; one was on "The Eye of Monoculus Polyphemus" and the other on "The Teeth of Fishes." These were communicated by Sir Joseph Banks. Andre was not himself a Fellow.

In Jesse Foot's scurrilous life of John Hunter (p. 267) he says that Andre

> . . . came to John Hunter, an anatomist, already in a style the most perfected perhaps of the modern age. He was bred up in the school of Watson and seemed to have pursued dissections and to have made preparations purely from the admiration of the arts. His delight in excellence was such that he would not permit any undertaking to go forth from his hands with the possibility of any superiority in perfection. His neatness in dissections, his knowledge of the arts of injections and preparations, his deep acquaintance with natural history and above all his modest merit and humble deportment sent him to do that for John Hunter, no one besides could have been found to have done for him and which he could never be brought in any large scale to do for himself. Besides these excellencies he was found to be necessary to John Hunter in all points and that upon stipulated terms of a very inferior degree. He was his amanuensis and this native philosopher was seen, when I went to John Hunter's warehouse to purchase his book on the Venereal Disease, folding up the sheets of it for the women to stitch them together. Such are the ludicrous sports of fortune. It is with infinite pleasure I am able to tell that he has found a retreat, secure from the perilous peltings of adversity as domestic librarian to a nobleman whose highest characteristic is to venerate virtue and to protect merit.

This paragraph is a good example of Foot's criticism. As I have remarked elsewhere there is generally a strand of truth in the fabric of his hatred: that strand of truth has its value. William Andre on succeeding Lynn in 1784 remained with John Hunter until the year 1788–89 and it must have been shortly afterwards on Hunter's recommendation to the Earl of Egremont that Andre took up his residence at Petworth House. This was George O'Brien Windham, 3rd Earl of Egremont, who, born in 1751, is said to have made Petworth House a nursery of art and a college of agriculture. He was the patron of Turner, Constable, Haydon, Flaxman, Nollekens and many others and is said to have spent £20,000 a year for sixty years on charity. It was probably in reference to his experiments on the breeding of animals that he became acquainted with John Hunter and his interest was fired by Jenner's publication of his pamphlet on Vaccination. As early as 1799 we find evidence of that interest in a letter from Andre addressed from Petworth to Dr. George Pearson reporting on some 14 cases which Andre had vaccinated with matter which had been sent from Brighton and which produced a disease in every shape resembling the smallpox. This matter proved to have been taken from some patients at Brighton who had been inoculated with the disease. In 1805 we find Lord Egremont writing Dr. Walker acknowledging the receipt of vaccine and saying he is now well supplied. "I wish," he writes, "the opposers of the cowpox could see how little their arguments avail when a death or two by the smallpox occurs. They are rushing from many miles round to be vaccinated and already some hundreds have been placed in security so that those two poor victims have not died in vain." The letter is signed "Egremont, Petworth, 20 Nov. 1805." In the following year on the occasion of Jenner's birthday, Lord Egremont attended a meeting of the

Royal Jennerian Society and bore testimony to the efficacy and utility of vaccination, and that several thousands had been vaccinated at Petworth, where from an early period the practice had been honoured with his Lordship's most zealous patronage and support. Inquiries at Petworth have led to no information as to William Andre's services but I have found his will at Somerset House, though it does not contain much of interest. He is described as William Andre, surgeon, of Petworth and he leaves to his sister Mary Ann, the wife of George Milne, carver and gilder of Charles Street, Hatton Garden, the whole of his property, money in the Funds, books and wearing apparel. Dated in 1798 it was proved February 11, 1808 by his sister and sole executrix: it is signed William Andre, without any accent. The fact that he was for between four and five years an assistant to John Hunter in the care and preparation of his museum, and that he had previously acted in a similar capacity to Henry Watson whose collections were afterwards purchased by John Heaviside, at whose death they were dispersed by auction, entitles William Andre to honourable mention among the anatomists of the 18th century.

EARLY MEDICAL EDUCATION IN THE FAR SOUTH*

By J. M. MASON, M.D.

BIRMINGHAM, ALA.

I

PREVIOUS to the year 1850, medical schools had been established in only five of the Southern states; Kentucky, South Carolina, Virginia, Georgia and Louisiana, in the order given.

This is accounted for when we remember that the section was sparsely settled, the population mostly rural, the pursuits largely agricultural, and that there were no large cities.

It is a tribute to the wisdom and far-sightedness of the founders of these schools that, with one exception, the institutions then established have maintained a continuous existence, and are now engaged in medical teaching, each in the city of its early location, either under the original plan of organization, or in an enlarged scope brought about by merger with other schools or annexation by state universities. The exception is the Medical Department of Transylvania University of Lexington, Ky.

This school had the distinction of being the first medical college to be established west of the Alleghanies, and in 1818 held the first medical college commencement to take place in the Mississippi Valley.[1] It united with the Kentucky School of Medicine of Louisville in 1850, and instruction in medicine was transferred to the latter city.

Medical teaching had been carried on in Louisiana for twenty-five years before the next of the Gulf States entered the field, when the Medical College of Alabama was established in Mobile in 1859.

Limiting my remarks to "Early Medical Education in the Far South," I shall present an outline of the foundation and development of the Medical College of Louisiana, now the School of Medicine of Tulane University of Louisiana, an institution whose influence in shaping the destinies of Southern physicians has been far reaching.

II

At the beginning of the nineteenth century medical education was in a chaotic state. Only four medical schools had been established in the colonies: The College of Philadelphia, 1765; The Medical Department of King's College, 1768; The Medical Department of Harvard, 1783; and the Medical Department of Dartmouth, 1798.[2]

The College of Philadelphia later became the University of Pennsylvania, and King's College of New York was the forerunner of Columbia University.[2]

Before the establishment of medical schools in this country it was the custom for those who were financially able, to go abroad for study. For others, the course usually followed was for the student to apprentice himself to some physician of note for a term of years and, upon completion of the apprenticeship, armed with a certificate of qualification from his preceptor, to set up as an independent practitioner, unfettered by the restrictions of examinations, licenses, or laws.

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* Address of the President, Delivered at the 43d Annual Meeting of the Southern Surgical Association, Lexington, Kentucky, Dec. 10, 1930.

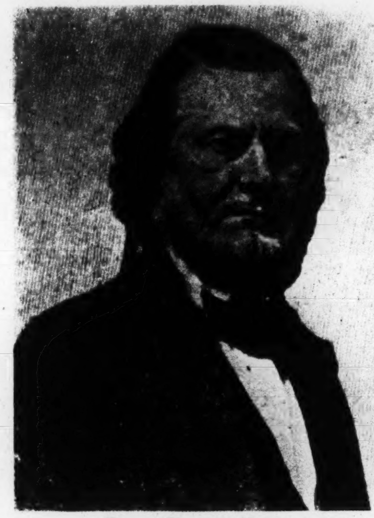


FIG. 1. THOMAS HUNT, M.D.

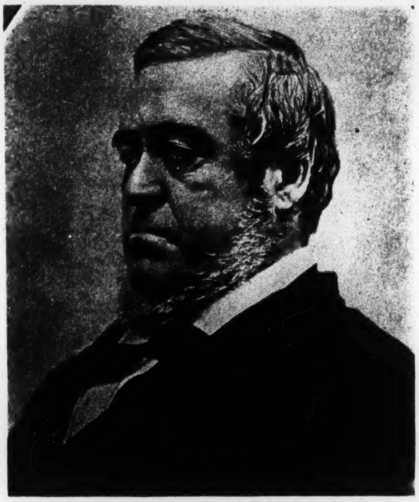


FIG. 2. WARREN STONE, M.D.

The frontier was being constantly carried by the adventurous farther and farther from the seaboard, and these four schools in the North and East could do but little toward supplying the need for educated physicians. Packard estimates that at the beginning of the War for Independence there were some 3500 physicians in the colonies, not more than 400 of whom had received medical degrees.[2]

Between 1758 and 1788, the University of Edinburgh records the names of 63 graduates from America, an average of 2 per year for this institution. One may gain therefrom an idea of the paucity of the numbers who were able or who considered it necessary to go abroad for medical study. Even Ephraim McDowell, whose name goes down in history as one of the greatest pioneers in surgery, had no diploma, although he studied two years in Edinburgh, and it was not until 1825 that he received the honorary degree of M.D. from the University of Maryland.[3]

John Archer was the first person to receive a medical diploma following a course of study in America. This was granted on January 1, 1768 by the College of Philadelphia. In 1720, however, Yale had conferred the honorary degree of M.D. upon Daniel Turner who had been a great benefactor of the school; and the facetious ones of that day insisted that the M.D. signified *Multum Donavit*, and not Doctor of Medicine.[2]

III

In 1803 the importance to the United States of the vast territory tributary to the Mississippi had gained such recognition that it was acquired from Napoleon through the Louisiana Purchase.

This included the present state of Louisiana and the City of New Orleans which had been founded by Jean Baptiste LeMoyne, Sieur de Bienville in 1718; and, at the time of the purchase had a population of 10,000.

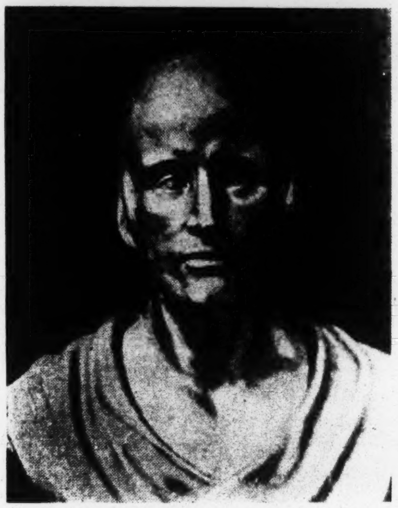


Fig. 3. J. H. Harrison, m.d.

Unlike New England and the cities of the Atlantic Seaboard, whose medical thought and surgical teaching were largely dominated by the English schools, Louisiana had developed under the influence of Continental Europe and Latin America. Although visited by DeSoto in 1542 Spain had laid no claim to the region, and in 1682 Robert Cavalier, Sieur de LaSalle, came down the river from French colonies farther North and took possession in the name of France. In 1762 it was ceded to Spain and remained a Spanish possession, though essentially French, until 1800 when it was again acquired by France and in 1803 was sold to the United States.[4]

Isolation from the Atlantic Seaboard and from centers of learning which were springing up inland was well nigh complete, owing to the inadequacy of land transportation and the great distance which had to be traversed by sea in rounding the Florida peninsula before reaching any of these ports.

To realize the degree of this remoteness, one has but to recall the fact that Andrew Jackson won the Battle of New Orleans on the field of Chalmette on January 8, 1815, two weeks after a Treaty of Peace between this country and Great Britain had been signed. This unnecessary battle was due entirely to the isolation of this section and to the inadequacy of methods of communication and transportation in use at that time.

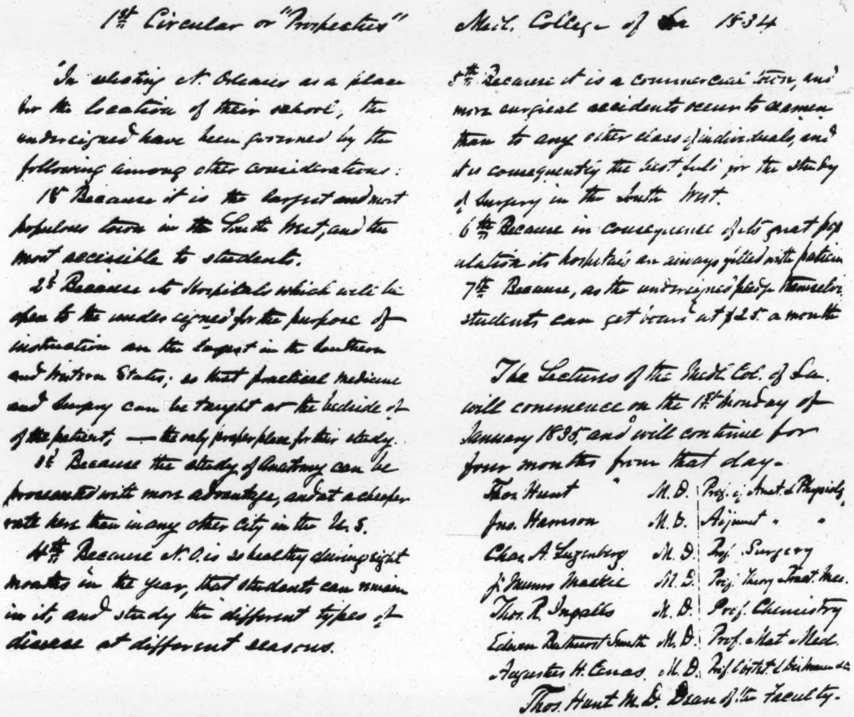
IV

In 1808 were born three remarkable men who were destined to play a large part in the scientific and cultural development of Louisiana and the entire South. They were: Thomas Hunt of South Carolina, Warren Stone of Vermont, and John Harrison of Washington, D. C.

Hunt graduated in medicine at Pennsylvania at twenty-one years of age, then studied in Paris for one and one-half years. Stone graduated from the Medical School of Pittsfield, Mass., in 1831; Harrison from the University of Maryland in 1831.[5]

How providence or fate brought together Hunt and Stone in fighting a cholera outbreak and how they later removed to New Orleans where they met Harrison and laid plans for a Medical School, is an interesting story.

Stone located in Troy, N. Y., and immediately encountered an epidemic of cholera which had just been brought across the border from Montreal and Quebec. He was called on to treat the first case which appeared, and was active in the fight until the epidemic was wiped out.[5,6]



1st Circular or "Prospectus"

Med. College of La 1834

"In electing N. Orleans as a place for the location of their school, the undersigned have been governed by the following among other considerations:

1st Because it is the largest and most populous town in the South West, and the most accessible to students.

2d Because its Hospitals which will be open to the undersigned for the purpose of instruction are the largest in the Southern and Western States; so that practical medicine and Surgery can be taught at the bedside of the patient; — the only proper place for their study.

3d Because the study of Anatomy can be prosecuted with more advantage, and at a cheaper rate here than in any other City in the U. S.

4th Because N. O. is so healthy during eight months in the year, that students can remain in it, and study the different types of disease at different seasons.

5th Because it is a commercial town, and more surgical accidents occur to seamen than to any other class of individuals, and it is consequently the best field for the study of Surgery in the South West.

6th Because in consequence of its great population its hospitals are always filled with patients

7th Because, as the undersigned pledge themselves, students can get board at $25. a month

The Lectures of the Medl. Col. of La. will commence on the 1st Monday of January 1835, and will continue for four months from that day.

Thos. Hunt	M. D.	Prof. of Anat. & Physiol.
Jno. Harrison	M. D.	Adjunct " "
Chas. A. Luzenberg	M. D.	Prof. Surgery
J. Monroe Mackie	M. D.	Prof. Theory & Pract. Med.
Thos. R. Ingalls	M. D.	Prof. Chemistry
Edwin Bathurst Smith	M. D.	Prof. Mat. Med.
Augustus H. Cenas	M. D.	Prof. Obstet. & Dis. Women &c

Thos. Hunt M. D. Dean of the Faculty.

FIG. 4. PROSPECTUS OF THE MEDICAL COLLEGE OF LOUISIANA, 1834.

In the meantime he had decided to move to New Orleans, and, as has been recorded in the *Medical News*,[5] "His experience with cholera in Troy was but the introduction to the exciting siege with it in the cholera ship Amelia in which he embarked for New Orleans." The vessel sailed from New York with 108 passengers, four of whom were soon found to be ill with cholera. Four days out a terrific storm arose, and it became necessary to confine the passengers below decks with the hatches closed to prevent the ship from foundering. When the storm abated, Stone found twenty-five passengers dangerously ill with the disease. At Folly Island off the port of Charleston the vessel was beached and the passengers were landed. The island was put under quarantine and physicians were sent out from the city to enforce the quarantine and attend the sick.

Thomas Hunt of Charleston had been specially interested in cholera, and but a short time before had written extensively on the prevention, control, and treatment of the disease. The port authorities put him in full charge of the situation, with Stone as his first assistant and executive officer. This experience brought them together in a friendship which lasted throughout their lives.

When the epidemic had spent itself Hunt returned to Charleston to receive the plaudits of his home city for his valiant fight, while Stone proceeded to New Orleans; not, however, until he had fired the imagination of Hunt with the great possibility of medical development in Louisiana. He determined, therefore, to join Stone in New Orleans as soon as it could be arranged.

Stone landed in New Orleans in 1832 at a time when the city was in the grip of two epidemics, yellow fever and cholera. It is said that 6000 deaths took place from the latter disease during the year, an appalling mortality for a city of 50,000 population. He quickly obtained a position in the Charity Hospital, where his energy and ability were at once recognized, and where his experience in the management of cholera, gained in Troy and on Folly Island, gave him prestige which was maintained throughout his life.[5,6]

Hunt soon joined him, and was almost immediately successful in securing the position of House Surgeon in the New Charity Hospital which had just been completed. His great ambition, however, was to found a Medical

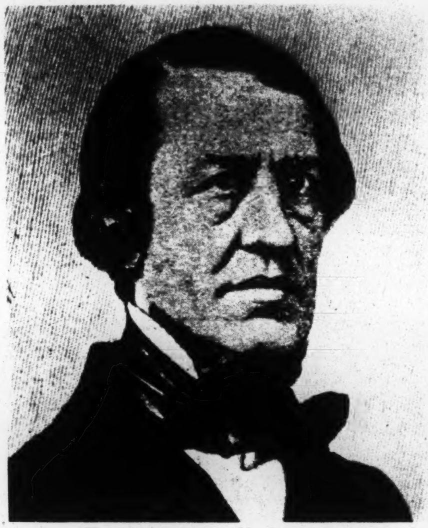


Fig. 5. Augustus H. Cenas, m.d.

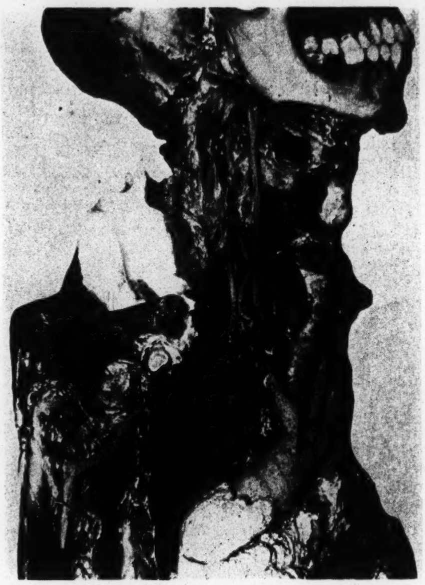


Fig. 6. First Successful Ligation of the Innominate Artery, by Andrew W. Smyth, Charity Hospital, New Orleans, May 15, 1864. Specimen in the Army Medical Museum, Washington, D. C., No. 48657. Acc. 21273.

"The innominate and common carotid were ligated May 15, 1864. Secondary hemorrhage occurred on about the tenth day. Ligature of the vertebral was performed and the aneurism closed. The patient left the hospital apparently cured, but still presented a small pulsating tumor about the size of a pigeon's egg. Ten years later he came back with the tumor as large as ever. He had taken to house painting and had used his right arm enormously. The internal mammary was ligated but without benefit. The sac, threatening to burst, was opened with the hope of plugging the opening of the aneurismal artery but in vain. Plugging en masse was effected without avail. The patient died of hemorrhage within forty-eight hours. The autopsy was made by the writer. It showed that the return circulation was due to the anastomosis of the perforating aortic intercostals with the branches of the subscapular in the substance of the great serrate muscle, through which the blood flowed freely through the axillary to the sac. We had thought of these anastomoses as being the principal channels through which the upper extremity was nourished, but it never entered our minds that there was also an upward or retrograde current running back towards the heart. That portion of the axillary artery extending from the origin of the subscapular to the aneurism was carrying a double current, that is a to and fro current. It may be better understood by saying a systolic retrograde current to the aneurism and a diastolic direct current to the arms. The ligature of the axillary between the subscapular and the sac would have cured the case."[10]

School; and in John H. Harrison, also recently arrived he found a kindred spirit, a soundly educated young man who shared his purposes and ambitions.

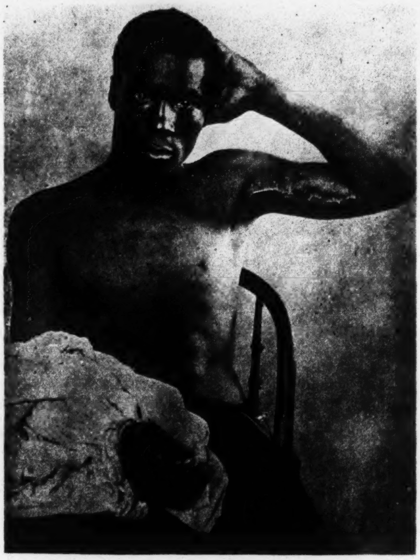


FIG. 7. FIRST ANEURISMORRHAPHY, BY PROFESSOR RUDOLPH MATAS, CHARITY HOSPITAL, NEW ORLEANS. May 6, 1888.

Evidently these three recognized the importance of the Charity Hospital for clinical teaching, for we find that their next move resulted in the resignation of Hunt from his hospital position to give his time to the organization of the school, while Harrison succeeded him as House Surgeon, with Stone as Assistant House Surgeon.

Their plan of organization was superb. Hunt was to arouse the city to a realization of the possibilities of such a school as they proposed, while Harrison and Stone obtained control of the clinical material upon which the success of the school so largely depended. For sheer audacity, no undertaking of Dumas' great heroes, Athos, Porthos, and d'Artagnan, ever approached the great adventure upon which these youths set out, all of them strangers in this long established and practically foreign city, none of them more than twenty-five years of age. Yet they succeeded, and in 1834 the Medical College of Louisiana was formally organized.

FIG. 8. PAUL TULANE.

V

EARLY CHARITY HOSPITAL

To further account for the successful establishment of this Medical School we must pause here, and trace the origin and development of that great clinical adjunct, the Charity Hospital. Though the Memorial Tablet in the main hall of the hospital states that:

> The Charity Hospital of Louisiana was founded in 1786 by Don Andres Almonaster y Rojas—Fossier dedicated his history of the institution To the memory of Jean Louis, New Orleans' first benefactor and founder of the Charity Hospital.

Let us follow the succession:

Jean Louis, a sailor sometime retired and a resident of New Orleans, died on

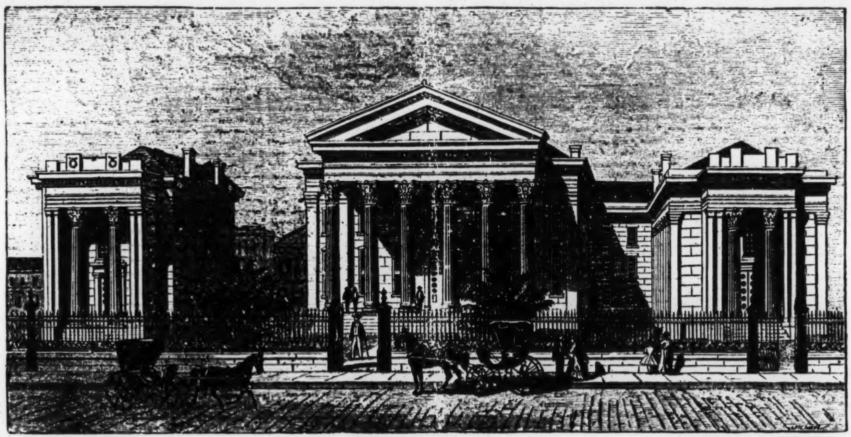

LAW DEPARTMENT.
MEDICAL DEPARTMENT.
ACADEMICAL DEPARTMENT.

Fig. 9. University of Louisiana. The Central Building was the Home of the School of Medicine from 1847 to 1893.

January 21, 1736, leaving an estate valued at 12,000 livres or francs; which, in his will, he bequeathed "to serve in perpetuity to the founding of a hospital for the sick of the City of New Orleans." This hospital, the St. John, was erected on the square now bounded by Rampart, Basin, St. Peter and Toulouse Streets. It was opened in 1737 and was in successful operation for forty-two years, being completely destroyed by the disastrous hurricane of 1779.

Don Andres Almonaster generously offered to rebuild the hospital at his own expense, contributing the huge sum for that day, of $114,000.00 for its erection, and promising a yearly appropriation for its support, but stipulated that salvaged material from the destroyed building must be made use of in the reconstruction.

Violent opposition to his proposal arose, prompted no doubt by the political and personal jealousies of the day, but of these we know nothing definite. So, it was not until 1782 that Charles III of Spain gave his consent to the rebuilding. The hospital, of 24 beds' capacity was erected on the original site of St. John's Hospital, and was called the San Carlos. It was completed in 1784.

Don Almonaster was declared patron of the Hospital by Royal Decree, and the keys of the Hospital were bestowed upon him.

Baron de Carondelet upon being appointed governor, proved unfriendly to Almonaster, and deprived him of the rights and privileges of founder and patron of the Hospital from 1792 to 1794. Almonaster fought the matter through the highest Spanish tribunals, and the King himself approved the court decisions, all of which were in Almonaster's favor.

He remained thereafter in full control of the patronage of the hospital until his death on April 26, 1798.

Following his death and the change in government from Spain to France and from France to the United States, the affairs of the institution became much tangled, and the Legislative Assembly of the Territory of Louisiana at its first session in 1808 took steps to gain control of the institution.

In 1811 the Marquise of Pontalba, Almonaster's daughter and heir, relinquished all her privileges of patroness to the city corporation of New Orleans. This act of relinquishment, together with subsequent legislation, paved the way for a Board of Administrators for the hospital, six of whom were to be appointed by the Governor and three to be elected from members of the City Council. The first Board took office in 1811.

The following members composed the Board: Appointed by the Governor, Messrs. Felix Armand, Drew, Joseph Mantefut, Butler, Bellechasse and M. Foster: Elected from the City Council were: Messrs. Robelot, Castenado, and S. Henderson.

In the meantime, in 1809, the San Carlos had been completely destroyed by fire, after twenty-five years of service of incalculable value to the City. Five years went by before a suitable hospital site was secured. In 1814 the Board of Administrators obtained the square bounded by Canal, Common, Dryades and Baronne whereon they erected a hospital of 120 beds, known from this time on as the Charity Hospital. The cornerstone was laid in 1815, and the hospital was opened for the reception of patients a few months later.

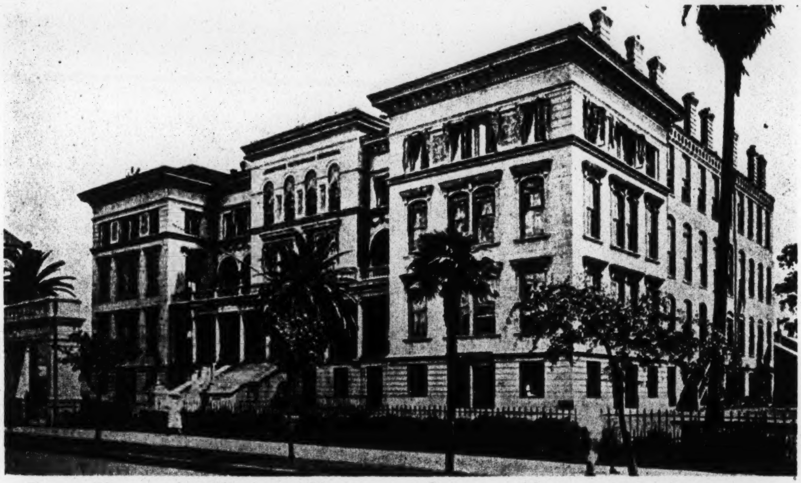


FIG. 10. HUTCHINSON MEMORIAL, HOME OF THE SCHOOL OF MEDICINE FROM 1893 TO 1930.

Demands on the hospital became so great that in 1831 it was necessary to enlarge its capacity. Accordingly the grounds and buildings then in use were disposed of, and the present site of the Charity Hospital, the square bounded by Geronde, Gravier, St. Mary's and Common, was purchased. The main building of the present hospital was erected in 1832 and patients were removed thereto in 1833, just at the time that Hunt, Stone and Harrison appeared in New Orleans. This account establishes the direct connection between Jean Louis' original legacy and the present Charity

Hospital; all of which is set down, not in disparagement of the generous contributions of Don Almonaster, but to do justice to the memory of Jean Louis, who has been all but overlooked.[7]

Fossier, the historian of the hospital, records an achievement which stands to the everlasting credit of Dr. F. W. Parham, a former President of this Association. He says:

> In that same year (1887) Assistant House Surgeon, F. W. Parham, introduced strict antiseptic measures in the Obstetrical Wards, and also instituted asepsis in his surgical service. This was one of the most important steps in the evolution of the present modern Charity Hospital.[7]

VI

Now to return to our founders.

In a day of meager medical preparation, here were three highly educated medical graduates. Hunt and Harrison were of most cultured and aristocratic lineage, Hunt having the further advantage of wider vision and greater experience gained by his residence abroad. Stone inherited from his New England ancestry the rugged constitution, the keen intelligence, the practical common sense and the capacity for hard work which enabled him to "carry on" years after Hunt and Harrison had passed away.

How these three young men so quickly succeeded in identifying themselves with the new Charity Hospital which opened its doors just as they arrived on the scene, we do not know. We may assume that their plans were carefully laid; and we do know that with such vision, such energy, and such determination as they possessed, they would prove invincible in anything they undertook. They fully realized the need of educated physicians in a section so remote as Louisiana and they visualized the growth of a great school built around the clinics of the Charity Hospital.

Published accounts differ slightly as to who composed the original faculty, but among the priceless treasures in the Library of the School of Medicine of Tulane is a copy of the original prospectus of the College, in the handwriting of Stanford E. Chaille, Dean of the College for a long period of years. This I have been permitted to examine. The faculty as recorded by Hunt was as follows:

> Thomas Hunt, M.D. Professor of Anatomy and Physiology,
> John Harrison, M.D. Adjunct Prof. of Anatomy & Physiology,
> Charles A. Luzenburg, M.D. Professor of Surgery,
> J. Monroe Mackie, M.D. Prof. of Theory & Practice of Medicine,
> Thomas R. Ingalls, M.D. Prof. of Chemistry,
> Augustus H. Cenas, M.D. Prof. of Obstetrics & Diseases of Women and Children,
> Signed: Thomas Hunt, M.D. Dean of the Faculty.[8]

The prospectus carries the statement that "The lectures of the Medical College of Louisiana will commence on the first Monday of January 1835 and will continue for four months from that day."

It will be noted that Stone's name does not appear among the original teachers, but it is on record that Harrison was unable to undertake his first year's work by reason of ill health and that his duties were taken over by Stone who continued a member of the faculty until 1872, the year of his death.

Eleven students were enrolled for the first session, while sixteen are recorded for 1835–36 and twelve received diplomas at the end of the session of 1836.

For several years lectures were given at various locations: 41 Rue Royal, 239 Canal; 14 St. Charles, and at the Charity Hospital. By 1843 the growth and influence of the school had so far justified its existence that the State leased to it for a period of ten years a plot of ground on Common and Dryades upon which to erect a building.[8]

In this year the attendance was 38, and in 1846 with a permanent home in an adequate building the enrollment was 100. During this time (1844–47) the Charity Hospital was making extensions and improvements necessary for teaching the increasing number of students and for the care of the larger number of patients.

An amphitheater for lectures and surgical operations was built; and here was carried on this class of teaching until 1895 when the structure made way for the A. B. Miles Amphitheatre, which, with such improvements and additions as have been made from time to time, is now one of the most modern and convenient operating pavilions in existence.

VII

UNIVERSITY OF LOUISIANA

In 1845 the University of Louisiana was established by the Legislature and the Medical College of Louisiana was incorporated as its Medical Department. In 1847 an appropriation of $40,000 was made for the erection of a larger medical building.

This building, the center of the group on Baronne, Common and Dryades, was familiar to all those students who enrolled between the years of 1850 and 1893 for here they received their courses of instruction. Even as late as 1896 or 1897 the imposing group was standing, though unoccupied, when the buildings were finally removed and the ground leased or sold for the erection of play houses and mercantile establishments.

The holiday visitor to the Crescent City may now spend a pleasant evening in halls dedicated to Apollo, Thalia and Terpsichore; but if he be a physician, let him not forget that he is on holy ground, for here throughout a period of forty years, were expounded the greatest and profoundest teachings of Esculapius and Hippocrates.

I challenge the record of all time to produce a greater accomplishment than that of our Three Musketeers: having barely reached maturity they arrive as strangers in a long established city (of 50,000), entrench themselves in the most commanding positions in its splendid hospital; conceive and establish a Medical College, and give it over to the people as the Department of Medicine of the University of a great State; all within a period of twelve years.

From this date we may consider the foundation of the School to have been complete, and its future assured.

VIII

Ingalls, Luzenburg and Mackie resigned their professorships in 1836–37 and 38 respectively, but Hunt, Stone and Harrison, together with Cenas, continued at work, and the vacant chairs were filled. Harrison, perhaps the most brilliant, burned out first. Never possessed of a robust constitution, he died in 1849 at the age of forty.[5]

It is said that "in a few years he had read, translated, examined and experimented with every branch of science connected with the subject of physiology," and the brilliancy of his attainments was reflected in the forcefulness of his teaching. He lived long enough to become one of the organizers and editors of the *New Orleans Medical and Surgical Journal* in 1845. This journal has continued to be the vehicle through which the work of physicians of this section has been presented to the scientific world.[5]

Hunt, organizer and man of vision, spent twenty years in teaching, and threw the whole force of a strong personality, together with all his influence, into the advancement of the interests of the school.

From 1863 to 1866, when the school was forced to suspend its activities on account of the Civil War, he removed to Havana, received a degree in the name of the Royal University of Havana, and established himself in a large practice. He returned to New Orleans in 1866 and again threw himself into the work of rebuilding the school. He was successful in securing an appropriation from the Legislature of $25,000.00 for this purpose, but death overtook him in 1867, before the work was well under way.[5]

Stone has been described by Dr. C. J. Bickham, his intern in 1855 and 1856, as "cool, self-possessed, and grand in his whole nature, physical, mental, and moral." "Every visit to the hospital was an ovation to him which he acknowledged with becoming modesty, but which served doubly to inspire him."[5] Of the three he looms largest in the annals of New Orleans.

For six years he was House Surgeon of the Charity Hospital and for twenty-three years was Consulting Surgeon to the Hôtel Dieu. In 1839 he organized and operated for many years one of the earliest private hospitals in America, the Maison de Santé. These hospitals gave him an enormous amount of clinical material, and at his death in 1872, he was considered the greatest surgeon that New Orleans had ever possessed.[5]

IX

Few clinicians of this period were prolific writers, but I have been interested to note in reviewing the publications of Stone in the *New Orleans Medical and Surgical Journal,* the attention given by him to surgery of the blood vessels.

In 1845–46 we find a paper entitled "Observations on the treatment of wounded blood vessels"; in 1849 "Case of traumatic aneurism"; in 1859, "Ligature of the common iliac artery for aneurism—use of silver ligature."

Later we find that interest in vascular surgery was maintained by the surgeons of the Charity Hospital, and Andrew F. Smyth, House Surgeon, on May 15, 1864, successfully ligated the innominate artery for aneurysm, the first time in surgical history that this had ever been accomplished. The patient survived more than ten years.[9]

That this specimen has been preserved and is now in the Army Medical Museum, we owe to Edmund Souchon who held the Chair of Anatomy for years.

Through his ingenuity the autopsy was obtained; and through his skill as a prosector and his profound knowledge of anatomy, the collateral circulation was followed out and described.[11]

A consideration of this sustained interest in vascular surgery and of the bold operations upon the blood vessels by these pioneers leads one to the conclusion that the outstanding contribution to surgery of this school and this hospital at this period of their existence was the laying of the foundation for the modern treatment of aneurysm, as perfected years later by Matas in his operation of aneurysmorrhaphy.

While pursuing a subject quite unrelated to the history of the Medical School, I recently found reference to a paper by N. B. Benedict, M.D., of New Orleans, with this rather curious title, "On the Operation of Transfusion—Being the report of a committee read before the Louisiana State Medical Society, at its Fourth Annual Meeting, March 16th, 1853."[12]

This aroused my interest and I obtained a copy of the paper, which proved to be a brilliant and scholarly review of the history and present status (1853) of blood transfusion, together with the description of an instrument which the committee proposed as an improvement on that of Blundel, which seems to have been the one in use in England about that time.

This furnishes further evidence of the interest of the early surgeons of Louisiana in matters pertaining to surgery of the blood vessels.

At a still later period, this school and this hospital were to make great contributions to the development of abdominal surgery and gynecology through the work of Professor Ernest S. Lewis and Professor A. B. Miles.

Operative gynecology began in this school and hospital when Lewis assumed the chair in 1874.

Before this Association in 1901, at Richmond, he gave an interesting account of his first abdominal section which took place "between 1873 and 1876, when he first became connected with the college."

Miles' greatest contribution was his early successful work on gunshot wounds of the abdomen. In 1890 he reported before this Association the successful operation upon a case with 16 intestinal and 3 mesenteric perforations; and in 1893 made a further report of 15 cases with 6 recoveries.

As an example of his clear insight into this great surgical problem, I quote from a paper written just before his death, and quoted by Parker:[13]

> If the operation of enterorrhaphy be done before general peritonitis supervenes, and is done quickly, cleanly, and thoroughly, with judicious after treatment, the patient has more than even chances for recovery now, and surely these chances will be improved in the coming years.

X

Cenas was a power in the School. He had an advantage over the other founders in that he was a native of New Orleans; and was, no doubt, called upon on many occasions to act in the capacity of a liaison officer between the College and the citizens of the City.

He continued his work as Professor of Obstetrics and Diseases of Women and Children during twenty-seven of the years between 1834 and 1865.[5]

This is the branch of practice which endeared the "Doctor of the Old School" to the people of his community.

In medicine, Dr. Cenas was to the people of New Orleans what Stone was in surgery, the outstanding figure.

Commenting upon present-day conditions Mr. Gilbert K. Chesterton, noted British writer, recently said in *The Illustrated London News:*

> There is virtue lacking in the age for want of which it will certainly suffer and possibly fail. It might be expressed in many ways, but as short a way of stating it as I know is to say that, at this moment, America and the whole world are crying out for the spirit of the old South.

This spirit has never been expressed with deeper insight or truer feeling than in the writings of Thomas Nelson Page and George W. Cable.

Those of you who have not already done so will be repaid for taking a glimpse at the old South through the eyes of Thomas Nelson Page—"In Old Virginia." Then follow George W. Cable through "Old Creole Days," and read his masterpiece, "Dr. Sevier."

Old residents of New Orleans have told me that Dr. Sevier, about whose interesting life and wonderful character the story is woven, was none other than Dr. Cenas.[14]

Before taking leave of the founders, we should mention J. L. Riddell, who succeeded Ingalls as Professor of Chemistry in 1837 and continued in this chair for twenty-nine years. He was an able chemist, a naturalist of international fame and was an expert microscopist. In the latter rôle he made a lasting contribution to science.

Chaille, in his inimitable and forceful manner says, "As the inventor of the binocular microscope he is given due tribute in that literary mausoleum of the world's workers, The Encyclopedia Britannica."[5]

I have recently visited this mausoleum and read the tribute. It is presented to your attention as homage from a member of another generation to the memory of a great scientist.[4]

XI

PAUL TULANE

Paul Tulane[15,16] was born May 10, 1801, at Cherry Valley, near Princeton, N. J.

He says that he was the first of his family who was uneducated, but that this was his own fault due to his strong inclination to business. At the age of fifteen he began work in a store at Princeton, and later was allowed to travel extensively with a cousin. While sojourning in Nashville, he learned that the first steamboat was soon to arrive at Louisville from New Orleans, and rode on horse back to Louisville to meet this boat. This incident and the following are recorded here as they are of some interest to the people of Lexington and of this section of Kentucky.

He says that one of the things that first attracted his attention on this boat was the presence of certain Creole planters from Louisiana who were bringing their sons to place them at St. Joseph's College at Bardstown, Ky., and at Transylvania University at Lexington.

He said, "This seemed strange to me, and I had not lived long in Louisiana before I thought I would like to see a good College built there where the boys could be educated at home."

President Johnston believes that this probably was the origin of the great purpose which grew and developed until it found expression in his endowment of Tulane University.

He was a successful merchant in New Orleans, and amassed a large fortune before the Civil War. We are told that he sensed the approaching conflict, and had the sagacity to transfer a large part of his holdings to the North before the outbreak of hostilities. He lived in New Orleans until 1873 when he moved to Princeton, N. J., and resided there until his death, March 23, 1887.

During his residence in Princeton he no doubt became further interested in education by observation of the vast cultural influence being exerted on young men through Princeton University.

Approaching the end of his days, a bachelor and without close family ties, he decided to devote some of his wealth to improving the educational conditions in the State where his fortune had been made. Accordingly in 1882 he made a gift of more than $1,000,000 for "the higher education of the white young persons in the City of New Orleans."

After the legal delay incident upon organizing so great an enterprise, the properties of the University of Louisiana were transferred to the Tulane Administrators and the Tulane University of Louisiana came into being in 1884, and obtained a University Campus on St. Charles Avenue opposite Audubon Park. The first President of the University was Col. William Preston Johnston, son of General Albert Sidney Johnston, Confederate leader, who was killed at the Battle of Shiloh.

XII

RICHARDSON MEMORIAL; HUTCHINSON MEMORIAL

The medical school was not transferred to the new campus, for that would have removed the students too far from the Charity Hospital where their bedside teaching was conducted.

The building on Barronne and Common had, however, become antiquated and inadequate, so Mrs. Ida S. Richardson, wife of Dr. T. G. Richardson, Professor of Surgery from 1872 to 1887, donated, in 1891, a sum sufficient to erect the Richardson Memorial building on Canal Street at the corner of Villere, and this was occupied by the School of Medicine in 1893.[5]

In 1906 there was a reorganization of the medical curriculum, and instruction for the first and second years was removed from the Richardson Memorial to the Tulane campus.[8]

In the reorganization, the University also acquired as its graduate school of medicine, The New Orleans Polyclinic.

This institution had been founded in 1888 as a post-graduate school in order to utilize, as its organizers state, "the vast amount of clinical material afforded by the Charity Hospital during the six months of the year when the medical department of Tulane University is not in session."

It was in successful operation at the time of this reorganization, when it became a part of the University, and has since been continued as one of its very important departments.

Removal of the first two years' work from the Canal Street building necessitated the erection of a new building on the campus for medical teaching.

To this building was given the name Richardson Memorial, and the building on Canal Street became in 1910, the Josephine Hutchinson Memorial, following the presentation by her husband, of a fund for its purchase in memory of his wife.

From 1893 this building was the home of the Medical School and graduates of the past thirty-seven years will experience a feeling of sadness when they realize that the last class has passed through its halls, as the magnificent new home, a structure of 10 stories, on Tulane Avenue immediately adjacent to the Charity Hospital has been completed, and on December 10 was occupied with appropriate dedicatory exercises.

XIII

Time does not permit us to dwell on the accomplishments of those who were co-workers with our founders, or even to mention their names, but we must briefly refer to the renaissance after the interruption of the Civil War.

Hunt, Stone and Cenas were on hand and put their shoulders to the wheel, but they were far spent and their work was finished.

Hunt died in 1867. Cenas was forced to retire by reason of advancing years and failing health. Stone continued his work for six years when death overtook him.

The real work of rebuilding fell upon Richardson, Chaille, Joseph Jones, and Bemiss, who guided the school through the dark period of reconstruction, associating with themselves, from time to time, other able men who directed the destinies of the growing institution.

In the closing year of the 19th century, the faculty was composed of the following members:

John B. Elliott, M.D., Prof. of Theory & Practice of Medicine,
Rudolph Matas, M.D., Prof. of Surgery,
Ernest S. Lewis, M.D., Prof. of Obstetrics & Diseases of Women & Children,
A. L. Metz, M.D., Prof. of Chemistry & Toxicology,
L. F. Reynaud, M.D., Prof. of Materia Medica & Therapeutics,
Edmund Souchon, M.D., Prof. of Anatomy,
Stanford E. Chaille, M.D., Dean, and Professor of Physiology Hygiene, and Pathological Anatomy.

But why continue the narrative? The writer of history who brings his story too close becomes but the chronicler of current events and his story loses interest.

All of us know what is taking place today; most of us forget the things of yesterday; hence, to remind us, we must have historians.

XIV

Those of you who have visited St. Paul's in London have perhaps gone down into the crypt where some of England's greatest heroes rest. In an obscure corner is the grave of Sir Christopher Wren, architect of the vast Cathedral, marked by a simple marble slab bearing his name and an epitaph, startling in its brevity but wonderful in its full significance.

Could the shades of Cenas and of Our Three Musketeers revisit the scenes of their early labors they might well make use of the words of the epitaph:

Si Monumentum requiris, Circumspici!

XV

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MAIMONIDES' HYGIENE OF THE SOUL*

By HARRY A. SAVITZ, M.D.

BOSTON, MASS.

FRIDAY, December 13, 1929, marked seven and a quarter centuries since the death of the Talmudist, Philosopher, Astronomer and Physician, Moses Ben Maimon—RaMBaM, usually called Maimonides. He died at Cairo, December 13, 1204.

He was born at one o'clock on the afternoon of March 30 (Nisan 14) 1135, on the eve of Passover, the Jewish holiday of freedom. His genealogy has been traced to Judah the Prince, compiler of the Mishnah, and through him to the Royal House of David.

So memorable is everything connected with the life of that great personage, that even the hour of his birth has been recorded. The hour of his birth seems to have been symbolic of his life. Whatever subject he delved into, whether theology, philosophy or medicine, he endeavored to clarify it by the pure light of reason. From his earliest youth he was dominated by the power of clear systematic survey, and a love of methodical regularity. As the great historian Graetz[1] described him: "Through reading and intercourse, he obtained a fund of solid information, and his clear intellect which ever sought to penetrate the phenomena of the visible and the invisible world, and to make them transparent, regulated his knowledge, however various and diverse it was."

Maimonides was one of those rare intellectual lights who abhor the mystical, the secret, and the hidden, and ever tend to clarify, to systematize, and to simplify. As another biographer[2] says of Maimonides, "the mid-day sun rather than the midnight lamp shines through all his work."

The coincidence that he was born on Passover Eve, when the Jew celebrates his delivery from slavery to freedom is also symbolic of his life. Maimonides was a child of his age and was bound to authority. In philosophy he followed Aristotle; in medicine, Hippocrates and Galen. Yet he was modern in the fact that he did not accept them wholly uncritically. Every theory was thoroughly dissected by his keen logical mind, and its component parts, thoroughly explained or modified and supplemented by experience from his own life. As Dr. Pagel[3] says of him: "Although Maimonides by way of introduction modestly assures the reader that he does not profess to present any original theories in his treatise, it does, nevertheless, contain throughout a number of original teachings, and it does bear the stamp of independent thought."

On the fourteenth day of Nisan, the Jew clears his house of bread, signifying that no complete freedom is obtained unless man frees himself from the bondage of pursuing bread and luxury. Maimonides practiced the healing art not merely as a source of income, but like an ideal physician, he looked upon his profession as a holy calling. With patience and wisdom he treated Jew and Gentile. He dedicated his life to toil and search for knowledge

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so as to increase human happiness. We get a glimpse into the life of Maimonides and the manner of his living by a letter he wrote to his translator Ibn Tibbon when the latter wanted to pay him a visit.

> Now God knows that in order to write this to you I have escaped to a secluded spot, where people would not think to find me, sometimes leaning for support against the wall, sometimes lying down on account of my excessive weakness, for I have grown old and feeble.
>
> But with respect to your wish to come here to me, I cannot but say how greatly your visit would delight me, for I truly long to commune with you, and would anticipate our meeting with even greater joy than you. Yet I must advise you not to expose yourself to the perils of the voyage, for beyond seeing me, and my doing all I could to honour you, you would not derive any advantage from your visit. Do not expect to be able to confer with me on any scientific subject for even one hour either by day or by night, for the following is my daily occupation:
>
> I dwell at Misr (Fostat) and the Sultan resides at Kahira (Cairo); these two places are two Sabbath days' journey (about one mile and a half) distant from each other. My duties to the Sultan are very heavy. I am obliged to visit him every day, early in the morning; and when he or any of his children or any of the inmates of his harem, are indisposed, I dare not quit Kahira, but must stay during the greater part of the day in the palace. It also frequently happens that one or two of the royal officers fall sick, and I must attend to their healing. Hence, as a rule, I repair to Kahira very early in the day, and even if nothing unusual happens, I do not return to Misr until the afternoon. Then I am almost dying with hunger. I find the ante-chambers filled with people, both Jews and Gentiles, nobles and common people, judges and bailiffs, friends and foes—a mixed multitude, who await the time of my return.
>
> I dismount from my animal, wash my hands, go forth to my patients, and entreat them to bear with me while I partake of some slight refreshment, the only meal I take in the twenty-four hours. Then I attend to my patients, write prescriptions and directions for their various ailments. Patients go in and out until nightfall, and sometimes even, I solemnly assure you, until two hours and more in the night. I converse with and prescribe for them while lying down from sheer fatigue, and when night falls I am so exhausted that I can scarcely speak.
>
> In consequence of this, no Israelite can have any private interview with me except on the Sabbath. On that day the whole congregation, or at least the majority of the members, come to me after the morning service, when I instruct them as to their proceedings during the whole week; we study together a little until noon, when we depart. Some of them return, and read with me after the afternoon service until evening prayers. In this manner I spend that day. I have here related to you only a part of what you would see if you were to visit me.

In such a manner he dedicated his life to the service of mankind.

Maimonides is ultra-modern in this respect, that the preventive side of medicine was ever foremost in his mind. Hygiene was the favorite theme for discourse with Maimonides. He strongly believed then, as most of us do at present, in the prevention of disease rather than in the cure of it. In his "Moreh Nebukim" (Guide to the Perplexed) which is not a medical work, but rather a philosophical one, he warns against the individual who partakes of a variety of food and whose only guide is his taste or caprice. The intake of food, he claims, should be based upon certain dietetic principles, whose aim it is to enhance the health and usefulness of the body. In such a manner he continued to prescribe various hygienic rules in aiding mankind to prolong life.

Maimonides also did not believe in dispensing various medications without due indications. He scorned those who took cathartics for every ailment. Such habits merely irritated the intestines. Man should rather live moderately and regulate his life so as not to fall a victim to disease. He states in the "Sefer Hamadah," "among a thousand persons only one dies a natural death; the rest succumb early in life owing to ignorant or irregular behavior."

Now, with regard to the soul, Maimonides followed the same trend of mind. We get a glimpse of Maimonides' conception of psychology in his "Shmoneh Prokim" or "Eight Chapters on Ethics" which is a psychological and ethical treatise on the "Ethics of the Fathers." The soul, according to Maimonides, is a unit having various activities called powers, and at times parts. Here again he breaks away from authorities. Medical authors speak, he says, however, of many souls, as, for instance, Hippocrates, who says there are three souls, the physical, the vital, and the psychical. There are five parts to the human soul: (1) the nutritive; (2) the perceptive; (3) the imaginative; (4) the appetitive; and (5) the rational. Other beings are spoken of as having these powers, but they are essentially different from those of man, whose soul, as the bearer of human properties, is not the same as that of other creatures, as the horse, the ass, or the eagle.

The *nutritive part* of the soul has seven powers, or properties; (1) the power of attraction; (2) the power of retention; (3) the power of digestion; (4) the power of repelling superfluities; (5) the power of growth; (6) the power of propagation, and (7) the power of differentiation between the nutritive humors and those to be repelled.

The *perceptive part* consists of the five senses, seeing, hearing, smelling, tasting, and feeling.

The *imaginative part* is the power of retaining impressions of objects even when they do not perceptibly affect the senses, and of combining them in different ways, so that the imagination constructs out of originally real things those that never have nor can exist.

The *appetitive part* is the power to long for a thing or to shun it.

The *rational part* is the power peculiar to man by which he understands, thinks, acquires knowledge, and discriminates between proper and improper actions.[4]

Just as the physician knows about the body as a whole as well as of individual parts, so must the moral physician know of the soul and its powers and parts. Did not the ancient philosophers lay down the dictum that the soul, like the body, can be healthy or sick? A healthy soul is in such a condition that only good and honorable deeds flow from it. The opposite is true of a diseased soul. Thus Maimonides in agreement with Aristotle declares that actions are good when they follow a medium course between two extremes which are both bad. This treatise, though based on psychology is more of a philosophical nature.

Maimonides' "Hygiene of the Soul," on the other hand, though it contains some ethical principles, intermingled with philosophy and theology, yet is in a sense a psychologico-clinical treatise. According to Dr. Kroner, it is based on an actual case. As was mentioned before, Maimonides was chief court physician at Fostat near Cairo. He was appointed to this high position by the brave and learned Sultan Saladin in 1179. He held this position with great dignity and marked esteem until the death of the sovereign, and was reappointed by the successor to the royal throne. In this capacity he composed a number of medical works which were mostly the results of inquiries made of him by his princely clientele. The following are some of these medical works. "Poisons and their Antidotes"; "A Treatise on Hemorrhoids"; "Asthma"; "The Sexual Life"; as well as some general works on Hygiene and Dietetics. According to Dr. Kroner, in one of his treatises on Dietetics, Maimonides devoted a chapter to the Sultan Almalik Alafdhal, a son of Saladin, who was a victim of melancholia. It is known as Alafdhal's case and called by another Arabian writer Aseibia, "Regimen Sanitatis," and in the third chapter it deals with the specific ailment of the prince. The rest of it is a compendium on principles of general hygiene. It was an important authoritative work which was widely distributed and translated into many languages. "The Essays on Hygiene, or Consultations with Malik Alafdhal" was translated into Hebrew by Moses Ibn Tibbon. A Latin translation was published in Venice, 1518, 1519, 1521 and in Leyden 1531. Another Latin translation was made from the Hebrew by John of Capua.

The major portion of Chapter III which deals with the effect of the soul is of some interest even today. Dr. Kroner translated it into German from the original Arabic of Maimonides and from the Hebrew translation of Ibn Tibbon.

My translation which follows is based on the Hebrew translation of Ibn Tibbon and the German translation of Dr. Kroner.

HYGIENE OF THE SOUL BY MAIMONIDES

It is known to my lord, may God lengthen his days, that the emotions of the soul bring about great, general, obvious, definite changes in the body. One sees how a person of robust build, sonorous voice, and blooming complexion, when he suddenly receives news that troubles him exceedingly, at once his color becomes pale, his look softens, his posture stoops, his voice becomes weak, and if he should want with all his might to raise his voice, he is unable to do so, his strength weakens. He often trembles on account of weakness, his pulse beat becomes smaller, his eyes sink into their orbits. His eyelids become so heavy that they cannot move, the body surface becomes cold, and his appetite vanishes. The cause of all these phenomena is the withdrawal of the natural heat and blood into the body. The reverse of this is seen in an individual of weak physique, changeable color, and tender voice, as soon as he is met with something that rejoices him a great deal, how his physical strength is increased, his voice raised, the face lit up, his movements become lighter. His pulse beat becomes stronger, his body surface warmer, joy and delight appear so evident that he no longer can conceal it and keep it to himself. All these happenings, the movements of the natural heat and the blood to the periphery of the body, the condition of the body, and the condition of the coward and the hopeful as well as that of the indifferent and phlegmatic person are well known, and likewise the conditions of the one in despair as well as of the one conscious of success are clear.

The discouraged one can hardly see as a result of lack of sight and his exhaustion, while the energetic person so greatly exaggerates his field of vision that he deludes himself that the light of the atmosphere increases and grows. This is clear to such a degree that one need not dwell upon it any longer. Therefore, physicians strongly recommend to look into the mental processes to investigate them so that an attempt should be made to hold them in balance in conditions of health as well as in sickness, and no other treatment is undertaken. The physician should notice accordingly that every sick person is depressed whereas every healthy person is cheerful, and he should, therefore, remove the mental effects which cause that depression, for in this way is the health maintained. It is of first importance in the treatment of any sick person, and particularly so in those suffering from a mental illness, as for example, in people of mystical disposition and melancholics, that the observation of mental irritation in these people be of prime importance. Equally true of a person possessed by delusion or fixed ideas, or one having a feeling of anxiety for something which may possibly cause anxiety, or the denial of something which usually (ordinarily) one enjoys, yea, in all of these cases, the able physician should not undertake anything else before relieving the mental condition, in so far as removing the irritations. Yet, the physician, in so far as he is a physician, should not endeavor to claim this procedure relative to the removal of the emotions, as a specialty of a particular knowledge, for in reality this subject belongs to practical philosophy, to the realm of moral teachings and normative ethics, for just as philosophers have written books about the various sciences, so they have also written many books about character development, education of the mind and the striving for its perfect structure from which only good activities would arise, and one should have an aversion against imperfections of character. To overcome these in the mind of every one who has a tendency thereof, they help in as much as this tendency, which calls awake all bad and unhealthy activities, disappears. Thus normative ethics, moral teachings, and the teachings of the prophets, God bless them, and their followers as well as the example of their perfect lives bring light to the qualities of the mind, that it becomes of such fine structure, that its activities only spring from the good and healthy. Therefore, this makes a great impression on such individuals only who have no knowledge of philosophic maxims, of normative ethics, and moral teachings, such as youths, women, and illiterates of the people. Behold, these are through the softness of their soul fearful and weak, and their fear becomes stronger when they meet with trouble, and any misfortune of the accidents of life, and they cry and moan and tear their cheeks and beat their breasts. For some the misfortune is so hard to bear that they either die at once or after a short time according to what it is that disturbs them. In the same measure, something of the pleasures of the world exaggerates their joy, and the individual thinks because of the insufficient education of his mind that he has received an unheard of good fortune and his pride and his vainness grow, and he exaggerates the fortune that he had received, and therefore shows great excitement. Their joy and their jubilation become so strong that some die of the greatness of their joy as the spirit is consumed on account of its sudden great extrovert tendency, as is also mentioned by Galen. The reason for all this, is the limpness of the mind and its ignorance of the reality of things. However, those who choose the philosophic maxims, or ethics or the teachings in morals, gain strength for their minds; they are the true heroes and their minds cannot be greatly influenced or altered. The more mental training one possesses the less he is affected from both conditions, fortune as well as misfortune; so when he receives from the world's fortunes that which the philosophers call "imaginative good fortune" he will not make much of it and similarly when a great misfortune befalls him, of the kind that philosophers call "imaginative misfortune" his balance will not be disturbed; he will bear it bravely. And really, this attitude of mind is formed when the individual evaluates the truth of things and recognizes the nature of reality; for instance, the greatest fortune in the world, even if it remains with him all his life, is a very small and insignificant thing. What good is it to him? He has to die like all other creatures. Likewise, the biggest of all misfortunes when compared with death seems doubtless much smaller than the latter. Therefore, one should control the influence of such misfortunes because it is less than that, without which there is nothing. Fortune, and misfortune, are rightly called "imaginative" by the philosophers. For behold: how many good fortunes are there which one believes to be really good, and in truth prove to be misfortunes, and how many misfortunes which one believes misfortunes, but which are really good fortune. Often some one receives a large inheritance or an important executive position, and just that is the reason for the destruction of his body, and his mind becomes used to the corruption of his character: it is further the reason for the foreshortening of his life, his distance from God, the praised one, and for the estrangement between him and his Creator. Thus it is for them an eternal misfortune. And often some one loses his fortune or his power, and just that is the reason for the strengthening of his body, the perfection of his mind, and the nobleness of his character, of the lengthening of his life, for his nearness to God and for the devotion to his services. What eternal fortune this is for him. The servant, [the author here calls himself servant] may his life be long or short, only sees that after knowing the views of the physicians and several philosophers and teachers of morals, who have preceded Islam, in general, that which the people deem a fortune is in truth a misfortune, and usually that what they believe a misfortune is in truth a real fortune. This treatise, however, does not intend the exploration of the truth of these thoughts and their explanation nor their function, as much has been written about this already at every era and by every educated people that shows interest in the sciences. The servant merely wants to point out with these suggestions an understanding for the training of the mind to regard affects as insignificant; this is brought about by considering the ethical writings, normative laws, teachings in morals, and the principles of the philosophers. Thus the mind becomes strong and regards the important as important, and the unimportant as unimportant. Thus affects become lessened, bad thoughts disappear, fear is taken away, and the mind is cheerful, as well as the whole person. The striving for all this is in itself very good; already bad thoughts disappear, also the cares and worries, and perhaps one can do away with them entirely, if one would let the following view come before one's spiritual eye: So it is: All that brings sorrow and disturbance to a person is nothing else but either of two things. Either he is worrying about things long past, as for instance loss of fortune or of some one who was dear to him or about things of the future and of whose arrival he is afraid, as for instance some one who worries and broods about any misfortune that might befall him. It is known to the intelligent thinker that brooding over what has past is useless, and that sadness and disturbance over things that are past belong to the activities of a less intelligent mind; there is no difference whether the person is disturbed because of loss of fortune or because he is a human being and not a king, or a star, or other impossible thoughts. Verily, the thoughts that cause heart failure because of what may possibly happen in the future must be abolished and therefore the consideration of anything that may happen to the person lies in the domain of chance: it may or may not happen. The same as one bemoans and worries because that what may happen, may happen; one's mind should expand by the hope and the confidence, that possibly the contrary of that what might happen, will happen, because that which may happen and its reverse are the two possibilities. This is the extent to which the servant thought it fit to investigate this matter in this treatise.

This is one of the reasons why the Arabic poet and cadi Al-Sa'id ibu Sural al Mulk sang of Maimonides in ecstatic verse.

> Galen's art healed only the body.
> But Abu Imram's (Maimonides)
> the body and the soul.
> With his wisdom he could heal
> the sickness of ignorance.
> If the moon would submit to his art,
> He would deliver her of her spots
> at the time of full moon,
> Cure her of her periodic defects.
> And at the time of her conjunction
> save her from waning.

In his seventieth year, after a complete and full life of service and guidance to humanity, the end came in December 13, 1204. A general outburst of grief ensued. For three days Jews and Moslems held lament in Fostat. Maimonides was buried in Palestine, at Tiberias where other graves and tombstones mark the resting place of other healers of the soul of his people.

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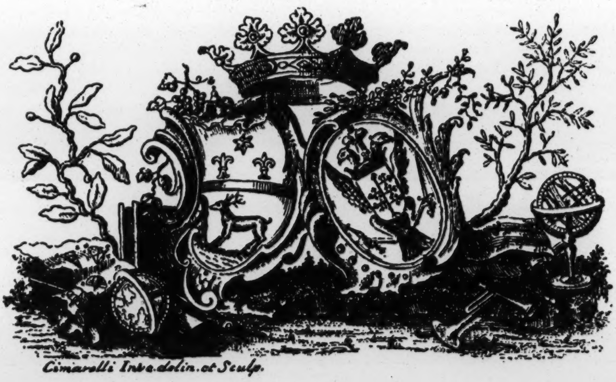
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A NOTE ON THE TREATMENT OF CARDIAC DISEASE IN THE TWELFTH CENTURY

By DANA C. MUNRO, AND CUSHMAN D. HAAGENSEN, M.D.

PRINCETON, N. J. NEW YORK

IN the "Alexiad"* Anna Comnena describes the life and deeds of her father, the Emperor Alexius I of the Byzantine Empire, "the great Alexius, a luminary of the universe, the sun of Anna." She gives a very clear picture of her father's last illness, and describes the symptoms and course of the disease. Anna was supposed to have some knowledge of medicine, and by the order of her mother, the Empress, she was present at the consultations of the attending physicians, and took part in their discussions.

Her account is of interest to physicians, as it illustrates the various methods of treatment of cardiac disease eight centuries ago. Alexius had to bear the ever-increasingly distressing symptoms of cardiac decompensation with the aid of no other remedies than exercise, phlebotomy, pepper, and, finally, the cautery. The diversity of opinions among his physicians, who were unable to agree as to which of these ineffective remedies to apply, is understandable.

Here follows Anna's account, omitting only those passages which add nothing of value.

The Emperor wintered in Calliopolis [1107–08] with the Empress (who, as we have mentioned several times, accompanied him because of the severe pains in his feet) . . . Now this disease had never attacked any of his ancestors, so that one might think it had been passed on to him by heredity; nor was it due to soft living which often gives it to those who are intemperate in their life and pleasures. But I will relate the real origin of this affection of his feet. One day for the sake of exercise he was playing polo with Taticius . . . Taticius was caused to swerve by his horse, and fell against the king, whose knee-cap was injured by the weight of the impact and the pain extended right down the leg. But, as he was used to endurance, he said nothing about the pain, and only had the leg slightly attended to, and as the pain soon passed he pursued his regular routine. This was the original cause of the Emperor's sufferings in his feet; for the local injury drew the rheumatics to the injured part. But the second and more active source of this trouble was the following.

Who has not heard of those countless hosts of Franks who arrived in the Queen of cities when they had quitted their own homes and invaded ours? By them the Emperor was engulfed in an immense sea of worries . . . In the morning, as soon as the sun had leapt above the eastern horizon, he sat on the imperial throne and gave orders that all the Franks should come in freely every day . . . Now the Frankish counts . . . possess a flow of language greater than any other human race . . . their speech was very long-winded . . . For even when evening came, the Emperor who had remained without food all through the day, rose from his throne to retire to his private bedroom; but not even then was he freed from the Franks' importunity . . . Like a hammer-wrought statue made perhaps of bronze or cold iron, he would sit the whole night through, from the evening until midnight perhaps, and often even till the third cock-crow, and very occasionally almost till the sun's rays were bright. All his attendants were dead tired and would retire and rest and then come back again grumbling. Not one of his courtiers could remain as long as he did without resting, but all kept fidgeting in one way or another . . . The Emperor alone presented an unyielding front to all this labor . . .

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* The Alexiad of the Princess Anna Comnena. Being the History of the Reign of her Father, Alexius I, Emperor of the Romans, 1081–1118 A.D. Translated by Elizabeth A. S. Dawes, M.A., D. Lit. London, Kegan Paul, 1928.

Clearly it was from this reason that the pain in his feet attacked the Emperor. And from that time on to his death the rheumatism visited him at periodical intervals, and caused him exquisite agony.

This was in 1097-1098. As he lived twenty years longer, possibly the Crusaders may be exonerated from this charge, although they undoubtedly did "bore him to death."

The chase and the game of polo were but of secondary, or tertiary, importance to my father, even while he was still a young man and before that monster, the affection in his feet, had fastened itself upon him like a sinuous serpent, and kept "biting his heel," as it says in the curse. But directly this disease commenced and began to increase, then certainly he gave himself up to gymnastics, and horse-exercise and other games for he was ordered to do this by medical science in order that by regular horse-exercise some of the fluid which descended might be dispersed and he might be relieved of the weight which pressed upon him. For as I have said above, this racking affliction of my father's arose from no other cause than his labours and fatigues for the glory of the Romans.

He had seven attacks in 1112 and 1113. Finally, in 1118, when he had reached the age of three score years and ten, came the end.

A year and a half had not passed after my father's return from his expedition before a second terrible illness fell upon him, and wove the noose of death for him . . . A race meeting had taken place and in consequence of a violent wind which was blowing at the time, the rheumatics had ebbed, as it were, and retreated from his extremities and fixed themselves in one of his shoulders. The majority of the physicians did not appreciate the danger to us which this threatened. But Callicles Nicholas . . . was a foreteller to us of our fearful ills and said he was very afraid that, as the rheumatics had retreated from the extremities and attacked another part, they would cause the danger to the sick man to become incurable . . . And not one of the doctors at that time, except Callicles, urged the cleansing of his system by purgatives. And he was not accustomed to taking these purgatives, in fact he was quite unaccustomed to drinking medicine. And so the majority of the doctors and above all Pantechnes Michael absolutely forbade any purging. But Callicles foresaw the future and said to them most emphatically, "Now that the matter has left the extremities and settled in the shoulder and throat; afterwards if it is not evacuated by purgatives, it will flow into one of the principal members or into the heart itself, and cause irremediable mischief." For I was there myself by order of my mistress to adjudge the physicians' arguments, and I heard all they said and for my part agreed with Callicles' proposals. However the vote of the majority prevailed. Then at length the pain after exerting its sway over the imperial body for the usual number of days died away and the invalid recovered his health.

Six months had not passed before a deadly sickness took hold of him, caused probably by his deep despondency over daily business and the mass of public duties. And I have often heard him speaking about it to my mother, and, as it were, accusing it to her. "What in the world is this disease which has attacked my breathing? For I should like to take a deep, full breath and get rid of this trouble worrying my heart. I have tried to do it repeatedly, but cannot manage to lift even a particle of the weight that is oppressing me. For the rest it is as if a very heavy stone were lying on my heart which cuts my breathing when I sigh, and I cannot understand the reason of it nor what has brought this suffering upon me. And I will tell you something else too . . . a fit of gaping often attacks me, and when I am inhaling my breath gets caught and causes me very great pain . . . "

She [the Empress] frequently sent for the more skilled physicians and compelled them to enquire closely into the nature of the disease, and asked to be taught the immediate and the indirect cause of it. They placed their hands on his arteries and acknowledged that they found in every movement of the arteries proof of manifold irregularities, but they were quite unable to discover the cause. They knew too that the Emperor's diet was not rich, but exceedingly moderate and plain like that of athletes and soldiers, and such as to prevent the rise of humours due to too rich a diet. Consequently they referred his difficulty in breathing to some other cause, and said that the immediate cause of his illness was nothing but his intense application to business and his continual and numerous worries, by which his heart got inflamed, and drew all that was superfluous out of the rest of the body.

After this the dreadful disease which had seized the Emperor gave him no respite whatever, but throttled him like a noose. And the disease made so much progress daily that it no longer came on at intervals, but continuously and incessantly, and the Emperor was unable to lie on either side and had not the strength to draw a breath without making a violent effort. Then every physician was summoned and the Emperor's illness was the subject of their discussion. They were divided in their opinions and at discord, and each one diagnosed it differently and tried to apply the treatment according with his diagnosis. But, however that was, the Emperor was in a very bad state; for not even for a moment could he draw breath freely. He was obliged to sit upright to breathe at all; and if by chance he lay on his back or on one side, alas! for the consequent suffocation. For he was unable to draw in or out even a tiny draft of the outer air by the channels for expiration and inspiration. And, whenever sleep pitied him and overpowered him, then also he was liable to suffocation; so that at all times, whether sleeping or awake, the danger of strangulation hung over him. As he was not given purgatives they had recourse to phlebotomy, and they made an incision at the elbow; however, he derived no benefit from it, but breathed with just the same difficulty as before and there was always the danger that by breathing so little he would expire under our hands. But his condition grew easier after he had been given an antidote of pepper . . .

However, it was all a delusion, for on the third or fourth day the same fits of suffocation and the same difficulties with the lungs attacked the Emperor again. I wonder whether he was not made worse by that draught, for it spread the humours without getting a hold over them, and drove them into the cavities of the arteries and aggravated his illness. From that time on we could not find any way of making him lie down comfortably, for the disease had reached its height . . . I have often, or rather continuously, seen my mother spending a sleepless night with the Emperor, sitting behind him on the bed and supporting him in her arms and relieving his breathing somewhat . . . As no remedy could be found for the disease, the Emperor moved to the part of the palace which looked to the south . . . After this he was removed from the large palace to Mangana. But even when this had been done, it did not contribute to the Emperor's recovery.

It is interesting to note that the devoted wife, and the loving daughter who described the death bed, were trying until the last moment to persuade the Emperor to disinherit his son John and to recognize Anna's husband as the heir to the throne.

But when the Emperor's abdomen had swollen and become very prominent, and his feet had swollen too and fever mastered his imperial body, then the doctors had recourse to cautery, and thought little of the fever. But all treatment was useless and vain, nor did the cauterization help, but his digestive and respiratory organs remained in the same bad state. And now as if from some other source the rheumatics introduced themselves into the uvula and the palate, as the medical fraternity term it, and his gums became inflamed and his larynx congested and his tongue swollen; consequently the ducts, through which nourishment had to pass, were narrowed and closed up at their extremities, and the terrible evil of starvation loomed before us . . . Eleven days had gone by since the final stage of the disease attacked him, rose to its height, and threatened danger . . . his condition became worse, and diarrhoea supervened . . . In the morning some of the Asclepiadae had anointed the Emperor's head, for so it seemed right to them, and then they went away home, not idly nor because of any pressing necessity, but because they knew that danger was closely impending over the Emperor . . .

Then, although he was dying, and the pain was overwhelming him, the Emperor proved himself stronger than [suffering and] death, as it were, and was distressed about the Empress, and tried with one of his daughters to subdue her excessive anguish . . . Soon he fell into his third faint . . . and a change of place for the imperial couch seemed advisable . . . and we carried the Emperor on his couch to another part of the five-storied building, in the hope that he might breathe fresher air and recover from his faint . . . Some of the Asclepiadae came back again and after waiting a little, felt the Emperor's pulse . . . the beating of his arteries . . . all the same they dissembled about the fatal moment and held out fair hopes which were not justified. But they did this with a definite purpose, for they thought that, when life departed from the Emperor's body, the Empress would breathe her last too.

But I again put my right hand on his wrist and watched the movement of his pulse . . . I recognized that all his strength was giving away and that the pulse in the arteries had finally stopped, then I bowed my head, and exhausted and fainting I looked down to the ground, said nothing, but clasped my hands over my face and stepped back and wept.

With her father's death ended the hopes which Anna had cherished for more than a quarter of a century, since she was a child of eight, that she herself might be empress. Her brother, probably acting under his father's advice, seized the sacred palace before his father actually died, and, out of caution, for fear lest he might be assassinated, refused to attend his father's funeral. A little later Anna was discovered in a plot against her brother's life, and was kept under close surveillance for many years. After her husband died in 1137, she produced her great work, the "Alexiad."

THE MEDICAL LITERATURE OF GUATEMALA

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I. The First Guatemalan Medical Publication

The earliest medical work to be printed in Guatemala was José Flores' "Especifico nuevamente descubierto en el Reyno do Guatemala para la curación radical del horrible mal de cancro," Guatemala City, 1782.[1]

José Felipe Flores was born in Chiapas on May 1, 1751, according to Garcia Pelaez (Mariano Padilla states that Flores was born in 1758). He was educated in the Colegio de Jesuitas de la Antigua Guatemala and in 1775 was graduated as a bachelor of medicine. In 1780 he received the grade of *licenciado*. Flores was surgeon and physician to the Hospital de San Juan de Dios for twenty-two years (1774–1796) and professor of medicine in the Universidad de San Carlos de Guatemala.[2]

Flores was particularly distinguished as an anatomist. Three of the models which he made for use in the teaching of anatomy are still preserved in the Universidad de Guatemala. These exhibit the skeleton, nerves, and muscles respectively.[3]

The "Especifico" was also printed in Mexico City in 1782. Léon gives the following collation for the Mexican edition.[4]

Especifico/nuebamente descubierto/en el Reyno/de Goatemala,/para la curacion radical/del horrible mal de Cancro, /y otros mas frequentes./(Experimentado ya favorablemente en esta/Capital de México.)/Su Autor/el Dr. D^{n} Jose Flores /del Gremio, y Claustro de la Real Vniver-/sidad de de dicha Goatemala, su Patria./Dase al Publico/a espensas de un espíritu patriótico./Reimpreso/con las licencias necessarias./En Mexico en la Imprenta de D^{n} Phelipe Zuñiga y/Ontiveros, Calle del Espiritu Santo, año de 1782.

4to.; vuelta blanca; 1 hoja preliminar s.n. y 15 págs. nrs.

This differs slightly from another collation given elsewhere by León.[5] Although León was a very careful and competent bibliographer, it is likely that the variation between the two collations is due to errors in copying or proof-reading.

Especifico/Nuevamente descubierto/en el Reyno/de Goatemala,/Para la curacion radical/del horrible mal de Cancro,/y otros más frecuentes./(Experimentado ya favorablemente en esta/Capital de Mexico.)/Su autor/El. Dr. Don José Flores/del Gremio, y Claustro de la Real Univer-/sidad de dicha Goatemala, su Patria, /Dase al publico/á expensas de un espíritu patriótico./Reimpreso/con las licencias necesarias./En Mexico, en la Imprenta de D. Felipe de Zúñiga y/Ontiveros, calle del Espíritu Santo, año de 1782.

En 4°, con 15 págs. y 1 hoja de introducción.

The copy which I have examined does not agree with either of these collations.[6]

Especifico/Nuevamente Descubierto/en el Reyno/de Goatemala,/para la Curacion Radical/del Horrible mal del Cancro,/y Otros mas Frecuentes./su Autor/el Dr. D. Jose Flores/*del Gremio, y Claustro de la Real Universidad de dicha Goatemala, su Patria.*

/Dase al Publico/A Expensas de un Espirtu Patriotico./Con Las Licencias Necesarias/ [three parallel lines, the lower one heavier than the other two] /en Mexico, en la Imprenta de D. Felipe de Zúñi-/ga y Ontiveros, calle del Espíritu Santo,/año de 1782. *Binding:* white laid paper wrappers corresponding to that used for the text. Size 5¾ × 7¾ inches. Twenty pages consisting of: title, verso blank; [i–ii] "Amado Publico"; 1–15, text, [16] blank.

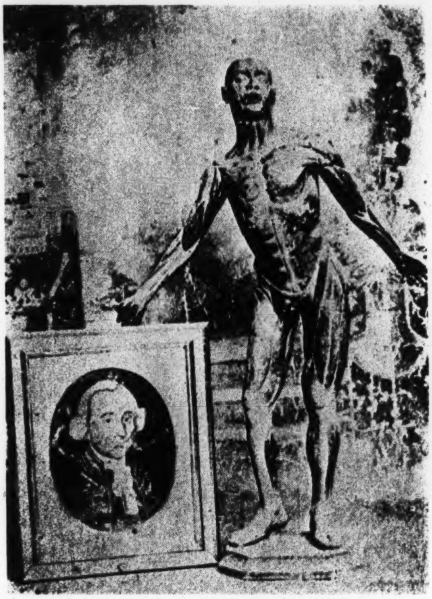

Fig. 1. Doctor Don José F. Flores.

It will be noted that the lines ("Experimentado ya favorablemente en esta/Capital de Mexico") and "Reimpreso" occur in both collations of León but are missing in the copy just described. This is of considerable bibliographical significance. It is inconceivable that these were twice interpolated by León. Is the statement, previously accepted by bibliographers, that the Mexican edition was a reprint of the Guatemalan edition, based upon the word "reimpreso?" The accuracy of this statement may now be questioned.

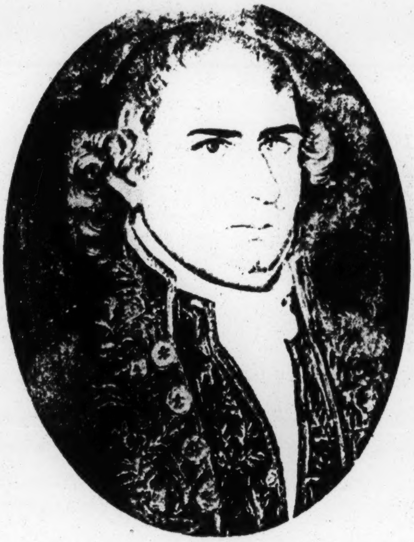

Fig. 2. Doctor Don Narciso Esparragosa y Gallardo.

The copy in the Lane Medical Library is probably the first Mexican edition (hitherto undescribed) and may actually be the first edition. The copy or copies described by Léon are, in my opinion, reprints of this edition, the word "reimpreso" so signifying. It is impossible to determine upon the basis of an examination of copies the priority of the Guatemalan edition. Guatemala, in 1782, was a part of New Spain. Medical works had been appearing in Mexico City, the capital, for 212 years.

The Flores' pamphlet is here translated into English for the first time. It should be of considerable interest to medical historians.

Brief notice concerning the lizards of the village of San Cristoval Amatitan in the land of Guatemala with which cancer and other diseases may be cured.

In the rich lands of America, the Indians find abundant materials for food, clothing, and shelter, in fact everything that is necessary to assure them health and happiness; natural products are at hand to cure those diseases which have elsewhere mocked the wisest physicians. We should not therefore refuse to learn from these simple people but rather should we attempt to acquire knowledge by cultivating an acquaintance with them thus discovering important specifics, which eloquently manifest their efficiency by results, and learning many curious facts relating to anatomy. This is true of the subject here set forth.

José Ferrer, a Catalan by birth and a resident of Guatemala City, had for more than a year suffered from a cancerous growth on the right side of his upper lip; this growth having involved half of the tissue of the cheek, spread to the lower lip on the same side, then to the jaw where it destroyed four back teeth, and thence descended toward the throat The attending physician realized that the carotid artery would soon be involved and that this would result almost immediately in a fatal hemorrhage. The fetor, the spreading ulceration, and the progress of the cancerous growth all indicated that the disease was in its last stages. Every resource of the medical art having been brought to bear upon the disease during its course without result, the patient who had been suffering a daily martyrdom was advised by his physician that there was no hope of a cure. Realizing that his end was near, he determined to prepare for death and so visited the Church of the Candlemas for the purpose of consulting with Father José de Eloso, his parish priest, concerning the salvation of his soul. Who would have imagined that by an act of providence the medicine requisite for a cure of Ferrer's cancer should have been made known to this good priest? While the two communed together concerning various matters pertaining to the situation of the sick man, the priest recalled the following notable occurrence.

Some time ago while he was parish priest of San Juan Amatitan[7] he had been called to San Cristoval, a village within his charge, to hear the confession of a sick parishioner. Upon this occasion, the Alcaldes of the village complained to him concerning a young Indian woman who sought alms from door to door in the town in order that she might support her husband. The priest sought out this man and asked him why he was thus dependent upon his wife. He received a prompt answer. The man said that he was afflicted with buboes and ulcers.[8] The unhappy man was actually covered with ulcers from head to feet. Filled with compassion, the priest determined to transport the man to Guatemala City where he might possibly be cured, but the Alcaldes opposed such action as unnecessary since they already had in their village a cure for this disease. The priest urged that they do what he desired, but seeing that the Indians had such confidence in the efficiency of their remedy and were so anxious to put it to the proof, he decided to bide his time and to await the results. These were both prompt and favorable for within a few days they returned to him bringing the Indian entirely cured. The astonished priest asked the Indians to reveal to him the nature of the remedy which in this case had been so efficacious. They readily complied, telling him frankly that certain lizards existing in the village when eaten raw would cure ulcers and buboes. This was the remedy which had been given to the Indian and which had restored him to health.

At the conclusion of their conversation, the priest persuaded Ferrer to eat of the lizards of San Cristoval in the same manner as did the Indians, adding that there could be no harm in experimenting to see whether or not the virtue of these animals extended to the cure of cancerous growths. The urge of necessity quickly induced the sick man to avail himself of a remedy which seemed so favorable. A trial of the lizards would be by no means difficult, without danger, and might help him. The lizards being brought from San Cristoval, he ate three of these after the Indian custom and within five days felt a fever in all parts of his body, and was bathed in a copious sweat. His spittle became abundant, thickened, and of a yellow color; the fetor begin to disappear. He then ate five more of the lizards. In the course of a few days sloughing begun; this was followed by the appearance of healthy flesh. Finally the ulcers were completely healed and scarcely any imperfection could be observed. Nicolás Verdugo, professor of surgery, who had attended Ferrer and knew how great had been the corruption wrought by the cancer, could not cease wondering at the prompt restitution of his face to its natural state.

Such a result could not fail to arouse general interest especially among the members of the medical faculty who hastened to find out as much as they could concerning the use of this specific among the Indians and the method of its application. The data gathered as a consequence of this inquiry are set forth in the following statement.

Method by which the Indians of San Cristoval Amatitan make use of the lizards found in that village to cure ulcers and buboes.

The Indians are not fastidious in their eating. Seizing a lizard, they dexterously cut off its head and tail. The intestines are immediately extracted and the skin stripped off. The lizard is eaten raw while its flesh is still warm, being chewed and swallowed with complete serenity. A single lizard is consumed in this way every day.[9] They say that one is usually sufficient but occasionally as many as three are eaten. In this way, ulcers and buboes may always be cured. This disease is always endemic in the village. To render the remedy less disagreeable it is the custom of the Indians to macerate the tender flesh and bones immediately after the lizard has been skinned. It is then enclosed in a wafer and so administered to the sick. One lizard is sufficient to make two pills each a little smaller than a musket-ball. This procedure is carried out quickly so that the lizard may be consumed as nearly alive as possible in accordance with the method of the Amatitanecos.

These Indians have possessed this remedy from early times, applying it without mystery or reserve to ulcers and buboes and always with favorable results. Most of those questioned say that this practice was established before they were born and as far as they know was introduced into their village from the neighborhood of the village of Ysalco.[10] It is impossible to determine when this remedy was discovered or under what circumstances. It should be noted that only the Indians of San Cristoval make use of these lizards in the manner here referred to. Yet the Indians of San Juan and San Pedro Martir, neighboring villages, in the same parish, have equal need of the lizards to cure similar infirmities as have the inhabitants of San Cristoval Amatitan. This situation is remarkable in view of the fact that such marvelous effects have been reported in connection with the use of the remedy in the latter village.

Description of the lizards of Amatitan.

These semi-reptiles are quite properly called lizards as they have the same form.[11] Their length is between eight and ten inches and their width a little more than one half an inch. They are very quick and agile. Certain of these little animals are able to change their color, varying it between yellow and green; others are spotted. The skin is covered with triangular scales except towards the end of the tail. Presumably those which change their color are pregnant females as their bellies are broader and bulkier.

They bear their young in the trees. Their nests are made in any available holes in the rocks, brick-walls, and earth.

They live upon certain species of beetles called *ronrones*, flies which they swallow with great gusto, and bees captured one by one as they leave their hives. The young lizards, being quite slender, enter the hives and eat the honey. They are not poisonous, however, when seized in the hand an irritation and numbness of the fingers is experienced. Their bite is not followed by any swelling. We believe that the principle thought peculiar to the lizards of San Cristoval may upon investigation be found common to similar lizards found elsewhere in this country.

Ferrer is not the only one who has experienced the remarkable virtue of this specific. Immediately after the cure of his cancer was made public, Father Carlos Suncin of the parish of San Sebastian in this city determined to make a trial of the remedy. This priest had suffered for more than thirty years with a cancerous growth on the side of his nose. Although this had not shown any tendency to progress for many years, Father Suncin feared that it might become malignant and ultimately be the cause of his death. This apprehension induced him to eat three of the lizards of San Cristoval, one a day, in accordance with the method of the natives of that village. He became feverish, perspired freely, and finally salivation occurred. The cancer then disappeared much to the astonishment of all observers. Only a small scar remained where the cancer had been.

These notable experiments prove conclusively that the lizards of Amatitan, eaten in accordance with the method of the Indians, possess the power to cure cancerous growths and ulcers when the art of medicine can offer neither remote hope of a cure nor the slightest alleviation of the patient's suffering. It is certain that this remedy, if applied in time, is perfectly safe and powerfully effective. We have discovered the secret of destroying the venom of this bloodthirsty animal, if, as has been conjectured, it is true that the cancer is to be classed with the insects.[12]

After a little reflection concerning this remedy, it is apparent that in virtue it is akin to that of other remedies for these diseases previously discovered. The fever, sweating, and salivation induced by the lizards correspond to the action of mercury. It is unnecessary to take the same scrupulous precautions as are required in the use of that mineral substançe nor to fear the unfavorable results which sometime follow upon its use.

It appears that we have discovered in these animals an excellent vermifuge, an anti-hydrophobic, and that anti-variolic which the celebrated Boerhaave hoped to find in a certain composition prepared with antimony and mercury.[13]

The flesh, blood, bones, animal-spirit, and other parts analogous to the human body, possessed by these lizards are seen to be a useful remedy when eaten raw. This knowledge has been obtained by means of an extensive experimentation which will be continued by observing the effects from eating other animals in the same manner. These and other observations were made in the Royal Hospital, where six of the lizards were reared for the purpose of studying their life, sex, generation, and maintenance. At the end of the investigation, the results were communicated to the Royal Cabinet of Natural History[14] and to Europe. New Guatemala, March 6, 1782. Dr. José Flores.

Wide interest was aroused among the members of the medical profession by the publication of Flores' pamphlet. The Spanish text was reprinted in Madrid, Cadiz, and Malaga. An Italian translation by Carlos Maria Toscanelli was published in Turin and Naples in 1784. A French translation by M. Grasset appeared in Lausanne in the same year. The German edition, "Ueber den Rutzen und Gebrauch der Eidechsen in Krebsschäden, der Lustseuche und verscheidenen Hautkrankheiten," was translated and edited by Dr. Johann Jacob Romer. It was published in Leipzig in 1788 by Friedrich Gotthold Jacobäer. This book contains, in addition to a foreword by the translator, the following material relating to the subject: a letter from Dr. Aepli to Canon Kahn giving an account of the healing of a hardened testicle[15] by means of lizards; the preface to the Turin edition; the foreword of the Neapolitan publisher; a letter from a "creditable person" in Mexico, dated May 25, 1782; evidence from Cadiz of the healing power of this remedy in a case of cancer of the breast; an appendix by Dr. Meo; a letter from M. Demorande to the *Journal de Paris*, dated October 18, 1783; a letter from Signor Fontana to a friend written from Turin, July 30, 1784; evidence of the cure of cancer, in Piedmont, by the use of lizards; history of a venereal skin disease and a case of syphilis healed by the use of lizards, by Dr. Ludwig Meo of Turin; an anonymous account of the cure of a young woman; three observations concerning the healing power of lizards; an extract from the *Giornale per servire alla storia ragionata della medicina di questo secolo*,[*] relating to the use of lizards in the treatment of cancer, leprosy, and syphilis; extract from a letter written to the *Veckoskrift for läkare och naturforskare*,[†] by the Swedish General Consul Gahn; account of a cure at Cadiz in 1783 of a case of gonorrhea; a description of the particular species of lizard mentioned by Gahn, written by Professor Bergius; an extract from the *Medical commentaries*, collected and published by Dr. Duncan in London.[‡]

The publication of Flores' "Especifico" in Mexico City resulted in a controversy. Joséph Vicente Garcia de la Vega's "Discurso critico que sobre el uso de las lagartijas, como especifico contra muchas enfermedades" appeared later in the same year, as did the "Instruccion sobre el remedio de las lagartijas nuevamente descubierto para la curación del cancer, y otras enfermedades" of Antonio de León y Gama. The author of the latter work, although by profession a surveyor, was well informed concerning natural history and medicine. He contended that the lizards known in Mexico as cuetzpalin were as efficient in the cure of cancer as those of Amatitan. The "Carta apologética de las reflexiones sobre el uso de las lagartijas," published in Mexico City (also in 1782) was written by Manuel Antonio Moreno and Alejo Ramon Sanchez as a reply to the contentions of León y Gama. The following year, León y Gama published his "Respuesta satisfactoria á la Carta apologética que escribieron el Lic. D. Manuel Antonio Moreno, y el Br. D. Alejo Ramon Sanchez: y defensa contra la censura, que en ella se hace, de algunas proposiciones contenidas en la Instrucción sobre el remedio de las lagartijas." Reminiscent of the "House that Jack Built," this was immediately followed by "Observaciones critico-apologéticas, sobre la Respuesta satisfactoria de D. Antonio de León y Gama, y la instrucción sobre el remedio de las lagartijas, del mismo autor" from Moreno and Sanchez, published in Mexico City in 1783. Such exchanges are not unknown today but they occur in the journals and are usually terminated abruptly by impatient editors.

There must have been a marked rise in lizard mortality shortly after 1782

[*] 2: 343–350, 1784 (Venice).

[†] 8: 42, 270, 320, 1784.

[‡] (9: 477–479, 1785.)

as these animals were being eagerly devoured "as nearly alive as possible" in many parts of the world. Carrere, d'Aubenton, and Mauduyt report upon their use in France and Spain,[16] Meo writes a book concerning the results obtained with this remedy in Palermo,[17] while Romer records experiments in Turin, Naples, Piedmont, Cadiz, and Sweden. The "efficacy of the wood-lizard for curing the cancer, venereal eruptions, black scurvy, or any other scorbutic complaint" is the subject of a letter from a gentleman in St. Martin's to a friend in St. Christopher's (West Indies). One paragraph of this letter is so obviously a literal translation of a part of Flores' pamphlet that the writer must have had access to it either directly or indirectly.[18]

Although the early medical literature contains many references to the use of animal substances in the cure of disease much more attention was given to botanicals and mineral substances. Flores and some twenty other competent medical men of his time report favorably upon the use of these lizards in the treatment of syphilis, cancer, and leprosy. Their observations are reinforced by the testimony of a number of intelligent laymen including several clergymen. This evidence is of course all empirical yet so were the early reports upon the use of quinine, etc. Little scientific attention was given to the therapeutic potentialities of animal derivatives until a comparatively recent date. Nothing has been done to confirm or refute the results obtained by Flores. For centuries men suffered from diabetes, while fish had pancreases. It remained for Banting and McLeod to connect these two isolated circumstances by their discovery of insulin. We know practically nothing concerning the chemistry of the secretions of many animals including those lizards whose use aroused such high hopes during the latter part of the eighteenth century. Biochemistry has before it a wide field for research based upon the empirical observations to be found in the early literature which is now too much obscured; being left to the more or less exclusive attention of the medical historian whose work is often considered to have only a modicum of practical value.

NOTES

1. VAN PATTEN, N. The medical literature of Mexico and Central America. Bibliographical Society of America, *papers*, 24: 150–199, 1930.
2. ASTURIAS, F. "Historia de la medicina en Guatemala." Guatemala City, 1902.
3. LEÓN, N. Los precursores de la literatura médica mexicana . . . *Gaceta médica de México*, (3rd ser.) 10: 57, 1915.
4. LEÓN, N. Bibliografía mexicana del siglo XVIII. Sección I, parte 1. Mexico City, 1902, pp. 251–252.
5. LEÓN, N. *Op. cit.*, (3rd ser.), 1915, 10: 57–58.
6. This is in the Lane Medical Library, San Francisco.
7. "San Juan Amatitan is a village in the jurisdiction of the Alcalde of Sacatepeques, five leagues from Nueva Guatemala. It is located upon the shore of a lake. The village of San Cristoval is three leagues south of San Juan Amatitan, and San Pedro Martir, five leagues in the same direction. These small villages are on the bank of a river which flows in a canyon formed by the two famous volcanoes, those of Pacaya al Oriente, and is called the Agua de Goatemala al Poniente." Footnote, Flores' "Especifico."
8. Syphilis? Romer translates this "venerische Ausschläge und Geschwüre."
9. NUTTALL, Z. Causes of the physical degeneracy of Mexican Indians after the Spanish conquest. *J. Hyg.*, 27: 40–43, 1927.
10. "Ysalco is a considerable village in the jurisdiction of the Alcalde

of Sonsonate." Footnote, Flores' "Especifico."

11. "Lagartija" has been rendered throughout the translation as lizard. Literally the word means a small lizard. The ordinary word for lizard is "lagarto."
12. Flores gives this footnote: "De Sault. Sur la rage & sur les malad. venerien." Commenting upon this passage in a note Romer says: "Ich gestehe offenherzig, dasz ich nicht im Stand bin, aus diesem Satz, ich mag ihn nun für sich selbst, oder in Verbindung mit dem vorhergehenden betrachten, einem gefunden Menschenverstand herauszubringen. Wabescheinlich ist etwas in der Uebersetzung aus dem Spanischen ausgelassen, oder nicht recht verstanden werden. Die italianische und die französische Uebersetzung sind darinn einander vollkommen gleich. Ich fürchte übrigens, es werde noch mehreres, was gegen Ende dieses Briefes vorkömmt, dem philosophischen Arzte auch ziemlich unverständlich bleibem."
13. Boerhaave. "De cognoscendis et curandis morbis." Aphorism 1392. Variolae.
14. Madrid.
15. Orchioscirrhus.
16. "Histoire de la Société Royale de Médicine. 1785, pp. 337–343, 3 pl.
17. de Meo, J. B. Saggio intorno al nuova specifico delle lucertole. Palermo, 1784.
18. Originally published in the St. Christopher's *Gazette* and reprinted in *Med. Commentaries*, 9: 477–479, 1784.

II. ESPARRAGOSA AND HIS OBSTETRICAL FORCEPS

Napoleon has been credited with the observation that "History is lies agreed upon." Accepting this as having some validity, the history of medicine is no exception. The *malaria fable* with its romantic account of the Countess of Chinchon, her physician Juan del Vego, and Francisco López de Panizares, is familiar to all students of medical history.* Syphilis has a folklore all its own with ramifications extending into Haiti, Mexico, Palestine, China, and elsewhere. The obstetrical forceps and its association with the Chamberlens is referred to by many medical historians as though the last word had been said and the chapter closed.

It may be granted at the outset that the Chamberlens were familiar with an obstetrical forceps and that this instrument was probably devised by Dr. Peter Chamberlen (1601–1683). The Chamberlen forceps, discovered near Maldon, Essex, were presented in 1813 to the Medical and Chirurgical Society of London.

Arabian surgeons apparently used forceps for the delivery of the fetal head as such instruments are mentioned by Ibn Sina (Avicenna), Albucasis, and others. From descriptions and illustrations it may be concluded that these were employed only for cranioclasty. In the sixteenth century, Rueff made use of the duck-bill and other forceps in the delivery of dead feti. Such a procedure would naturally suggest itself to many obstetricians. The practice is frequently referred to in the early literature.

If the credit for the invention of the obstetrical forceps cannot be given to Narciso Esparragosa, he can at least be honored for the publication of the earliest paper upon the obstetrical forceps used today. There is no evidence that Esparragosa was familiar with the work of the Chamberlens. His conduct was in accord with the highest standards of medical ethics. Such a claim cannot be advanced for the Chamberlens.

Few medical historians are familiar with the name of the great Guatemalan physician, Narciso Esparragosa. Born in Caracas, early in the latter half of the eighteenth century, Esparragosa was educated there in the Universidad de Santiago de León. After receiving the degree of master of philosophy he began the study of medicine in the medical school of the same university under José Antonio Molina. The latter attested to this in a document dated March 18, 1786.*

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* The writer of this paper expects soon to publish a paper setting forth certain previously unrecorded facts concerning the discovery of quinine and its use in malaria therapy.

Coming to Guatemala in 1788, Esparragosa continued his medical studies at the Universidad de Guatemala where he was graduated on January 22, 1789, as a bachelor of medicine. Shortly after he obtained a licenciate in surgery.

Esparragosa was named as chief surgeon of the Hospital General by Bernardo Troncoso, then governor, in 1792. Later he was appointed physician and surgeon to the prisons and garrison.

As a preliminary to obtaining the degree of doctor of medicine, he applied in 1793 for enrollment as a master of arts in the Universidad de Guatemala. This was refused upon the ground that the Universidad de Santiago de León was not of the same rank as that of Guatemala which at that time recognized only the universities of Salamanca, Alcala, Valladolid, Lima, Paris, Bologna, and Mexico. A notable controversy then ensued which was only terminated after an appeal to the Spanish Crown. By royal decree, dated January 23, 1802, Esparragosa finally obtained the doctorate.

Under the sympathetic guidance of the distinguished physician and surgeon, José Flores, Esparragosa gained a reputation for his skilful surgery. He performed with success many major operations including that for cataract, and the extirpation of cancer.

In 1798, Esparragosa published in Guatemala City the paper, "Memoria sobre una invención fácil y sencilla para extraer las criaturas clavadas sin riesgo de la vida, ni ofensa de la madre." This work excited considerable interest among obstetricians especially in Spain and Latin America. Asturias† says concerning this:

> El nunca bien ponderado, immortal Esparragosa, á quien tanto deben las ciencias y la Universidad de Guatemala, inventa un forceps, llamandolo "Asa elástica," y que dió conocer una memoria que imprimio en esta capital de Guatemala, el año de 1798. Dicha memoria esta escrita correctamente, contiene citas numerosisimas que comprueban bastantemente la erudición y extensos conocimientos en la ciencia que profesaba, y tiene nueva observaciones personales. Tuvo mucha aceptación en todas partes donde fué conocida, y con especialidad en España donde por su immenso crédito fué reimpresa en Barcelona el año de 1846.

In the paper referred to Esparragosa says:

> Para proporcionarme con prontitud nuevas ocasiones de practicar nuevas operaciones (de partos) dirigi una carta á todos los curas párrocos de esta capital: para que siempre que por razón de su ministerio concurriesen á algun parto dificil, ó llegase á su noticia, me avisasen immediatamenta á cualquier hora; como en efecto, así lo han ejecudato.

Not satisfied with this, Esparragosa, anxious to increase his opportunities for obstetrical observation caused notices to be displayed in public places indicating his willingness to assist expectant mothers without regard to time or place in order that he might collect sufficient proof of the merit of his new instrument in difficult labor. Later in the same paper, Esparragosa has this to say:

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* Padilla, M. Biografía del Señor Doctor Don Narciso Esparragosa y Gallardo. (Francisco Asturias. Historia de la medicina en Guatemala. Guatemala City, 1902, pp. 490–498.)

† Asturias, F. Historia de la medicina en Guatemala. Guatemala City, 1902, pp. 363–369.

> Al cabo de algún tiempo comuniqué sus efectos al señor Doctor Flores, á quien agrado extraordinariamente, le pareció muy ingeniosa é hizo el mayor aprecio de la simplicidad del instrumento. El mérito de este profesor es muy distinguido para que omita que á su partida á Europa apenas me dejó otra recomendación que el que empeñase en la perfección del instrumento y le diera aviso de los progresos.

Aside from his important work in obstetrical medicine and surgery, Esparragosa was particularly distinguished as an anatomist and may justly be designated as the Guatemalan Vesalius.

When Flores went to Spain he was succeeded as proto-médico by José Antonio Cordova. The latter was succeeded by Esparragosa. In 1815, while holding this office, Esparragosa published another paper which is an important document in Guatemalan medical history. This was his "Método sencillo y facíl para el conocimiento y curación de las viruelas," in which he urged upon his colleagues the necessity of extending the use of vaccination if the ravages of smallpox were to be overcome. It is interesting to note that this was only twenty years after the publication of Jenner's paper, "An inquiry into the causes and effects of the variolae vaccinae" (London, 1798).

Esparragosa is still revered in his native country as a beloved physician whose skill was available alike to all classes. Upon his death in 1819, the Escuela de Medicina received his medical library of some six hundred volumes, a remarkably large collection for that day. Funds were provided by his will for increasing the library of the Establecimiento de Caridad and the construction of a new surgical amphitheater.

At his own request this great man was buried in the Potter's Field. His grave bears the simple inscription:

> Aquí yace el cadáver del Proto-médico señor Doctor y Maestro don Narciso Esparragosa y Gallardo, Cirujano de Cámara de S. M. quien no queriendu profanar el templo del Señor con so inmundicia y corrupción mandó á sus albaceas que lo sepultasen en este sitio. Año de 1819.

[From Franciscus Vallesius: Hippocrates, Coloniae, 1589.]

DISCOVERY AND DISCOVERERS

IN his spirited appreciation of Schaudinn, the discoverer of *Spirochaeta pallida,*[1] Professor John H. Stokes makes a serious historical omission when he states that Metchnikoff with Roux "had accomplished the first successful transfer of syphilis to apes" in 1905, for this had been done already in 1875 and 1877 by Edwin Klebs. His publications[2] on the subject can amply confirm this. The fact is generally accepted at least by those who are not overawed by the clamors of certain "microbe hunters" who date all advance in etiologic research from Koch, relegating to the antiquarian rubbish heap what came before from the brains and hands of Pasteur, Lister, Klebs and others. Metchnikoff himself was one of those for he told me some years ago that he had not the slightest doubt that Klebs was the first to have seen the *spirochaeta* and the first to have successfully inoculated apes with syphilis.

On reading carefully the two reports which antedate by nearly thirty years Schaudinn's discovery, one comes to realize at once why Klebs held in those years the undisputed leadership in an entirely new field of research. He possessed to a far greater degree than his contemporaries and co-workers in the same field (notably Pasteur, Lister and Koch) an unrivalled experience in pathological morphology, a very keen eye for microscopic analysis combined with a versatile technical talent. Stokes is amazed by Schaudinn's "astounding eyesight" which allowed him to dispense with a satisfactory dark field equipment, substage condenser, etc. Klebs' equipment was still simpler, and again simpler was that of a Leeuwenhoeck, of a Bichat who all made brilliant contributions to our knowledge of microscopic life,—so brilliant indeed that one sometimes wonders whether we are not getting spoiled by too much and too refined an equipment.

The report under consideration states: (1) that in syphilitic lesions there are regularly found spirillar organisms, slender motile rods 2 to 5 mikrons long, which seem to belong in Ehrenberg's botanical group of monads, and which Klebs names, because of their spirillar shape, "*helico-mon-*

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[1] *Science,* 74: 502–6, 1931.

[2] Klebs, Edwin. Ueber Syphilisimpfung bei Thieren und über die Natur des syphilitischen Contagiums. (Vortrag 51. Versamml. Deutsch Naturf. u. Aerzte, Cassel) *Prag. med. Wchnschr.* 3: 409, 1878. Klebs, Edwin. Das Contagium der Syphilis; eine experimentelle Studie. *Arch. f. exper. Pathol. u. Pharmakol.* 10: 161, 1879, (4 plates). Nachtrag: Pick, F. J. Mittheilung üb. d. z. Impfung verwendet. Fälle.

*ads"; (*2) cultures of these organisms are obtained on a special medium of isinglass jelly; (3) successful transfer of syphilis to animals was obtained only in apes (*macacus*), very suggestive but not entirely conclusive results in the case of subcutaneous inoculation of culture material (July 8, 1875), entirely conclusive in the case of inoculation with freshly excised material from a human primary lesion (Dec. 29, 1877). At this distance we have of course no means to control the exactness of all these findings. They are certainly impressive in view of the similar later findings. From what Prof. Ghon told me some years ago, the pathological institute in Prag still has the skull of the second ape with the very characteristic lesions.

If attention is called here to these overlooked facts, it is not done with the intention of making a claim for priority or for historical justice. It is unnecessary, for good work can stand on its own feet, and anyway, as Bertrand Russell might say, its neglect by others has no "cosmic importance" whatever. But it is of human interest, if not of importance, to note from these diggings in the past, the two historical phases in etiological research. Leaving the broader, pathological conconsideration of the rôle of microorganisms in animal economy, research assumed the form of a vast enterprise with the elaboration of a highly specialized methodology which focusses attention exclusively, or almost so, on the microbe or virus, forgetting, or at any rate neglecting, the fact that there is a human structure, a whole man, "himself a biological problem of no mean order," as Stokes well remarks. That the fruitfulness of an original idea is extinguished by the weight of subsequent methodological refinements is nothing new in history. The impressive edifice of medieval scholasticism erected upon Aristotelian and Platonic ideas is *the* gigantic monument to these vicissitudes of human thought. And do we not sometimes detect in the experimental subtilisations of modern research a resemblance to the scholastic method of syllogistic hairsplitting?

Results of course ought to tell. For the case under consideration Stokes notes regretfully that Schaudinn's discovery "has never yet been carried to its logical outcome for practical medicine," and that even the chemotherapy which it directly incited "was, in a sense, a premature blooming." But one marked effect it did exert. It called forth a very rapid acceptance by the profession which was expressed, Stokes says, in the appearance of 750 articles in about one year. In view of the negative practical results was there really a compensating theoretical gain in such literary overproduction? One has reason to doubt it when one sees how the bulk of the literature is swelled by purely classificatory and methodological reports which effectively screen a hustling world of workers from a view of the things that really matter. If we have made so little advance in the twenty-five years after Schaudinn's discovery, so that we do not know any more about syphilis than Klebs knew fifty-five years ago, it seems high time that we ask ourselves whether both theory and method are not defective somewhere. Luckily this question is being asked ever more audibly.

Another more general question is asked by Stokes as to the relative value in modern investigation of "genius" or the man of "persistent singleness of purpose" by which he means the strictly limited, specialistic worker. He declares himself for the latter, being dubious about "genius" though he thinks he "may still perhaps scatter over the whole field of a science a series of germinal or epochal discoveries." Hence he is not quite ready to agree with the Soviet delegates who last spring, at the History of Science Congress in London, pleaded with no mean dialectic ability for a history which was not "biographical apologetics or apologetic biography." . . . "Only when science itself is understood to be a function of society can there be given a scientific history of knowledge. Only because knowledge is an integral part of social life, is the history of knowledge an integral part of history."[3] Our current histories, our current speech, it must be admitted, utter the word "genius" too frequently and too loosely. It may easily be argued that in science there only once was a genius and that his name was Aristotle, for not only his fame but his contribution to thought have endured two thousand five hundred years, and it still influences us in every phase of scientific activity. "Genius" derives from sexual propagation, but the goodness of its productions cannot be measured by the tons of lifeless paper, it has only a living measure in time. Indeed "art is long and life is short."

ARNOLD C. KLEBS

Nyon (Switzerland)
November 10, 1931

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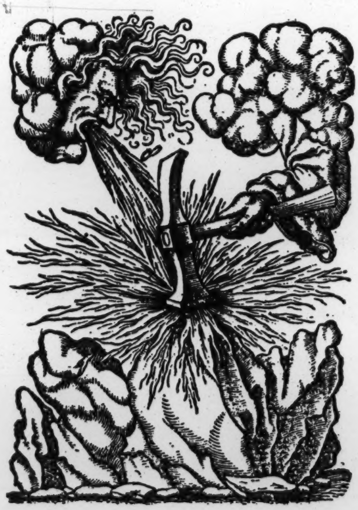
[3] Bukharin, N. In Symposium on the sciences as an integral part of general historical study. June 30, 1931 (Mimeographic report). The subject is also discussed in the same number of *Science* (p. 497, Nov. 20, 1931) in the interesting and valuable address of Professor Cecil H. Desch.)



BOOK REVIEWS

HISTORY OF MEDICINE IN THE UNITED STATES. By Francis R. Packard. 8°, 2 Vols., 1323 pp., 103 illus. N. Y. Paul B. Hoeber, Inc., 1931.

For thirty years running, this work was held the field as the authoritative history of medicine in the United States. The first edition was, however, a history of colonial and post-Revolutionary medicine in our country up to the year 1800, and is now out of print. The present edition, while originally planned to cover the period ending with the Centennial year, winds up, in reality, in the early eighties, an extension implicit in the very nature of the material. As it stands, the work is a monument to Dr. Packard's known reputation for painstaking accuracy, fair play, ripe judgment and comprehensive grasp of whatever he undertakes. It is, and will remain, the authoritative and reliable source book of the history of American medicine through the period covered.

A moment's consideration will convince any one familiar with the subject that the history of medicine in our country can never be developed *in extenso* as a continuous narrative in the sonata form, for the sufficient reason, assigned by Abraham Flexner, that its growth and extension, from coast to coast, was originally haphazard and caravan-wise, dependent, in great measure, upon the varying fortunes and abilities of those concerned in the vast *trek* from the Atlantic to the Pacific coasts. In his second volume, which covers most of his new material, Dr. Packard has, therefore, very wisely chosen to follow the general plan of his original volume, viz, development of his material along broad parallel lines, in this instance medical education, medical practice and education in the several states, foreign influences, individual achievements and the beginnings of specialism. To these main subdivisions are now added separate chapters on the Medical Department of the U. S. Army up to the Spanish-American War, by Colonel Percy M. Ashburn, on the Medical Department of the U. S. Navy up to 1928, by Lieut. Commander R. P. Parsons, and a number of appendices on such matters as the ether controversy, the chronology of early medical schools, important medical journals and irregular schools of medicine. While some of these, notably the appendix on "Women in Medicine," are a trifle sketchy and inadequate, the defect can doubtless be repaired in a subsequent edition.

The main body of the work affords an object lesson in painstaking search of records and it is difficult to see how such a great mass of disparate material could be otherwise handled in detail. The leading motives in the development of American medicine are the tendency of the physicians of the Atlantic seaboard to go to Europe to school and the necessity for self-development out of their own resources among the Western pioneers. The note of dependence upon Europe is sounded in the chapter on foreign influences (Ch. XIII). The biographies and achievements of some of the Western pioneers are given, *inter alia*, in Chapter XIV. The greatest of these (Beaumont, Drake, McDowell, Daniel Brainard) were born in the East, but their work was done, in an entirely self-reliant spirit, in the then wilds of the West.

Dr. Packard's volumes are profusely illustrated and supplied with very complete indexes of authors and subjects. It is to be hoped that the second edition of this standard work may be appreciated sufficiently to encourage its author to carry his next edition into the twentieth century. He is to be congratulated on what he has thus far accomplished.

F. H. GARRISON.

THE WILLS HOSPITAL OF PHILADELPHIA, THE INFLUENCE OF EUROPEAN AND BRITISH OPHTHALMOLOGY UPON IT AND THE PART IT PLAYED IN THE LAST 100 YEARS IN DEVELOPING OPHTHALMOLOGY IN AMERICA. By William Campbell Posey, M.D., and Samuel Horton Brown, M.D. Phila., J. B. Lippincott Co., 1931.

The first chapter of this well-told history of one of the most famous ophthalmic institutions in this country begins with a review of the history of the work done in ophthalmology by some American surgeons before its recognition as a specialty. Philip Syng Physick was especially renowned for his skill in operating on the eye, as was likewise William Gibson, his successor in the chair of surgery at the University of Pennsylvania.

Elisha North, in 1817, opened an eye infirmary in New London, which was the first institution exclusively devoted to the surgery of the eye in the United States, and George Frick of Baltimore published in 1823 the first American book on ophthalmology. A few years before this, eye and ear infirmaries had been established in New York and Boston. When James Wills, a grocer of Philadelphia, died in 1825, he left a large sum of money to found "The Wills Hospital for the Relief of the Indigent Blind and Lame." The actual construction of the Hospital was delayed by legal difficulties until 1834, when it was formally opened on the same location opposite Logan Square which it has occupied until the present time. The Authors think that Wills was influenced to leave the then large sum of over $100,000 for this purpose, by Dr. Joseph Parrish, who became the first president of the Board of Managers. From its first organization to the present day the staff of the Wills Hospital has always been composed of men of the highest standing in ophthalmology, although at the outset some of its members did not devote themselves exclusively to that specialty. The Authors give brief biographies of all these men, and pictures of very many of them, as well as of the men who served as managers of the Hospital from the time when it was under control of City Councils, throughout the period after it had passed under the control of the Board of Directors of City Trusts.

As early as 1839 Dr. Joseph Parrish began using the facilities of the Hospital for teaching purposes and his policy has been consistently pursued throughout all the succeeding years. There are several very valuable chapters on the practical work done at the Hospital and the many valuable contributions which have been made by its Staff from time to time to ophthalmology. There is an interesting account of the early opticians of Philadelphia and a bibliography of the books written by members of the Staff, a long and most creditable series of high grade works.

The Wills Eye Hospital has just completed the sale of its site and the building it has occupied for so many years. A new and splendidly equipped hospital is to be erected at Sixteenth and Spring Garden Streets, where, it is the hope of all its many wellwishers, that its career of usefulness and prosperity may be continued for many years. This book is a wisely compiled and well-written history of a famous institution. It contains much of great value to the science of ophthalmology as well as to the history of medicine. Its Authors are to be congratulated on a great task well done.

HISTOIRE DE LA MÉDECINE. Par A. Castiglioni, Professeur d'Histoire de la Médicine à l'Université de Padoue.French Ed. établie par les soins de l'Auteur. Tr. by J. Bertrand, Agrégie de l'Université et F. Gidon, Professeur à l'École de Médicine de Caen. Paris, Payot, 1931.

The original Italian edition of this most excellent and comprehensive history of medicine by the distinguished professor of the history of Medicine in the University of Milan, was reviewed in the ANNALS OF MEDICAL HISTORY, N.S., 1: 2, March, 1929. The present edition in French is practically identical with the Italian and deserves all the praise awarded to the original. The only other work of a similar kind comparable to it is that of Garrison, and like it it completely eclipses all the older histories of Daremberg, Bass, etc., both in plan and execution. Beginning with the prehistoric remains of the cave dwellers and the most recent revelations in paleopathology, subjects which have only recently been adequately approached, Castiglioni's book gives us a continuous résumé of the history of medicine down to the present time. The recent studies of Elliot Smith, Ruffer and Breasted have largely changed our conceptions of Oriental medicine and are given due weight by the Author. His account of Greek and Roman medicine shows a first-hand acquaintance with the texts and is noteworthy for the originality of many of his views. As one would naturally expect Castiglioni's book is especially interesting in its account of the rise of the Italian universities, and the splendid revival of scientific research which shed such luster on Italian medicine from the fourteenth to the sixteenth centuries. Here Castiglioni has evidently an advantage over all previous historians and his profound knowledge and enthusiasm for his subject make his pages thrill with interest. However, when he describes the epoch-making events in the history of medicine in other countries he shows alike both erudition and impartiality. In recent times none of the most recent important discoveries in the various branches of medical science have escaped his attention. The origin and progress of the various specialties are well told. To each section there is appended a concise but excellent bibliography, comprising references to a surprisingly large number of English and American publications.

The number, originality and excellence of the illustrations are remarkable. There is an excellent index which adds much to the value of the book. It is sincerely to be hoped that so valuable a work will soon find a translator who will render in English the service which Drs. Bertrand and Gidon have performed in French.

BIBLIOTHECA MEDICA NEERLANDICA. By the Dutch Society for Advancement of Science. 659 pp., Amsterdam, DeBussy, 1930.

This is the catalogue of the library which was founded in Amsterdam in 1849. In 1881, there were only 15 books on the shelves. Today, there are over 20,000.

The library confines itself to collecting the following:

1. Works of Netherland authors about medicine and allied sciences;

2. Medical works of foreign authors, printed in the Netherlands or in the Netherland colonies;

3. All the writings, of interest from a medical point of view, concerning the Netherlands and their colonies.

In 1926, it was realized that a new complete catalogue was needed and the present book is, therefore, the result of four or five years' work.

The classification follows medical science in all its branches. Its special sections for history, biography and bibliography are listed in chronological order and an alphabetical index at the end simplifies the finding of specific items.

Five Netherland incunabula are listed whereas the 16th and 17th centuries are well represented and, as might be expected in an Amsterdam library, special attention has been paid to Boerhaave and over 400 editions of his works are listed.

The format of the book is large, the typography excellent and easy to read. All in all, the "Bibliotheca Medica Neerlandica" is a bibliographic work that will be found of the greatest interest and value to medical bibliographers and historians.

EARLY THEORIES OF SEXUAL GENERATION. By F. J. Cole, D.SC. Oxon., F.R.S., Prof. of Zoology, Univ. of Reading, Oxford. New York, Oxford Univ. Press, 1930.

This most interesting study of an important phase in the history of biology opens with an account of the epoch-making discovery of Leeuwenhoek in 1677. Dr. Cole shows conclusively that the great Dutch observer was the first to observe and describe the spermatozoa, of which he wrote a description in a letter to Viscount Brouncker in November, 1677, proving that the student, Hartsoeker, based his subsequent claims to the discovery on a tissue of lies. Chapter II dealing with the later history of the spermatozoa is a revelation of the curious twists which may arise from theorizing on a scientific basis. For many years the origin, structure and meaning of the spermatozoa was discussed *ad nauseam*. The most discrepant ideas were advanced by some of the best scientific minds as to whether they were animalculae, products of putrefaction, essential to fertilization, etc. It was not until 1824 that Prévost and Dumas showed that if the male seminal fluid be filtered the residue is fertile but the filtrate sterile, thus proving the spermatozoa necessary to generation. They first suggested the histogenesis of the spermatozoa in the tissues of the testis. A few years later, however, von Baer first bestowed the name spermatozoa on them, thereby indicating his belief that they were parasitic animalculae, and Blainville was still discussing the classification of spermatozoa into genera and species, and questioning their importance in generation. Dr. Cole quotes the erroneous views of Pouchet and many others on the subject. In 1841 Kölliker finally settled the problem by proving that the spermatozoa were not parasites, but motile histological elements, which began as integral parts of the organ in which they occurred. The next section deals with the preformation doctrine, in accordance with which the embryo is perfectly formed in all its parts in the ovum before the act of generation takes place. Although the illustrious Malpighi describes with quite remarkable accuracy the development of the embryo chick, he was, nevertheless, according to his own statement, a preformationist. Later came endless disputes as to whether the miniature being was in the egg or in the sperm, between ovism and animalculism. Dr. Cole gives excellent summaries of the views of the leading participants in the controversy. In 1828 von Baer's classic work on embryology finally disposed of ovism and with it the doctrine of preformation. Although epigenesis, the successive formation and development of the various parts of the embryo after fertilization of the ovum, had been foreshadowed by Aristotle, William Harvey deserves the credit of bringing it prominently to the fore. In his work on "Generation," he seeks to elaborate the facts in proof of epigenesis, a word of which Cole thinks he was the coiner. It is curious to reflect that it was not until the latter part of the nineteenth century that the problem of fertilization was finally disposed of when it was proved that a single sperm penetrating within an egg, and equal participation of egg and sperm nuclei, result in fertilization, with consequent formation and growth of an embryo.

The Author states that this essay is a relaxation from his labor on a "History of Zoology," on which he has been employed for many years. Some years ago he published as a similar *relaxation*, "The History of Anatomical Injections," which appears in volume two of Charles Singer's "Studies in the History and Method of Science." Dr. Cole is too modest in the way he refers to these two really remarkable works on most important aspects of the history of biology. He has written a delightful as well as an authoritative work. The book is well illustrated and indexed.

KYKLOS. Jahrbuch für Geschichte und Philosohpie der Medizin Herausgegeben vom

Institut für Geschichte der Medizin an der Universität Leipzig. 12 illus., Leipzig, Georg Thieme, 1930, Vol. 3.

The third volume of Kyklos (the first two were reviewed in the ANNALS OF MEDICAL HISTORY on previous occasions) is a stately volume of 463 pages and comprises a series of disconnected articles on historic subjects. In length, thoroughness, and abstract speculation these articles are typically German and could not well be produced in any other country, certainly not in America or England.

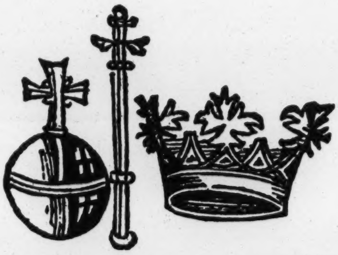
Hirschfeld's article on the Romantic movement in medicine in Germany is a profound study of this subject, with a bibliography of 1250 titles. Temkin contributes a valuable article on archaic medicine. D'Irsay's essay written in excellent English discusses in an entertaining way the scientific thought and enlightenment of the 18th century. Other articles of general interest are one of 75 pages on the "History of Gas Anesthesia" by Aronson, and one by Scheunert on "Civilisation and Neurosis" at the end of the 19th century which shows that the Germans are also suffering from the effects of an overstrenuous life.

Senf contributes an interesting article with numerous cartographic illustrations on the "Sweating Sickness in England." Leo Norpoth's study of the versatile medieval Italian Pietro D'Abano, is a masterly production. Puhlmann deals with the Latin medical literature of the early Middle Ages. Only a small portion of this literature is original; most of it represents translations from the Greek authors.

Professor Sigerist has made students of paleography his debtors by rendering the medieval abbreviations of weights and measures into their modern equivalents.

A concluding section brings a report of the activities of the Institute of Medical History in Leipzig. The afflux of students desiring to work is greater than the facilities, the Institute being severely handicapped by the economic condition of Germany. A grant from the Rockefeller Foundation or from some generous private individual would be of invaluable assistance to one of the most active institutions devoted to the history of medicine and science.

DAVID RIESMAN.



[From Nüremberg Ghronicle, 1493.]

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